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The role of trait emotional intelligence in predicting academic stress, burnout, and engagement in Japanese second language learners

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Abstract
The current study examined the relationship between trait emotional intelligence (TEI), academic stress, burnout, and engagement in Japanese undergraduate students learning English as a second language. One hundred eighty-four participants (females = 87, mean age = 19.7 years) completed two questionnaires, one administered at the beginning of the academic semester (i.e., baseline), and one administered at the end of the academic semester (i.e., follow-up). Structural equation modeling revealed that TEI factors predicted engagement and negatively predicted academic stress, while stress strongly predicted burnout. Cluster analysis and ANOVA revealed that participants with high TEI reported significantly lower scores for stress and burnout and higher scores for academic engagement (i.e., emotional and agentic) compared to participants with low TEI. In addition, exhaustion significantly increased between baseline and follow-up for participants with low TEI but not for participants with high TEI. For participants with high TEI, inadequacy significantly decreased whereas emotional engagement significantly increased between baseline and follow-up. Results suggest that increasing TEI may reduce academic stress and burnout while increasing engagement among second language learners in a Japanese context.

Keywords Emotional intelligence · Academic stress · Burnout · Engagement

Introduction

Over the past four decades researchers of L2 motivation have examined the psychology of language learners and second language teachers, and established that motivation positively influences L2 related behaviors, thereby contributing to positive learning outcomes. However, research on negative factors associated with teacher and student motivation in language learning contexts are often limited to demotivation (Kikuchi & Sakai, 2009) and anxiety (Dewaele & MacIntyre, 2014).

More recent research has examined the influence of emotion in language learning contexts (e.g., positive psychology) to determine the extent to which different positive and negative emotions interact to influence motivation in L2 language learners and other L2 related behaviors. For example, research has found that both negative (e.g., anger, embarrassment, disgust) and positive (e.g., joy, hope, love) emotions impact the motivation of L2 learners (MacIntyre & Vincze, 2017). Therefore, this past research provides a holistic view of the role that different, interacting, types of emotions play in predicting positive motivational outcomes in language learning contexts. However, studies examining emotion and L2 motivation have largely focused on positive outcomes in L2 contexts such as positive engagement, willingness to continue studying a language, interest in learning a language, positive attitudes toward learning a language, and successful academic outcomes (e.g., higher proficiency). Factors contributing to students choosing to discontinue their language learning (such as withdrawment from academic contexts or academic burnout) have not been the focus in L2 contexts.

In many second language learning environments, students must study an L2 regardless of their desire to learn a language. For example, in Japan students are required

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to study English under the language curriculum policies currently in place. As a result, many students may display symptoms of stress and burnout because of this long-term, compulsory educational system; these problems appear common throughout East Asia (Gao, 2016). Therefore, to facilitate sustainable language learning environments, specifically in contexts such as Japan and other Asian countries where students encounter limited exposure to English outside of the classroom environment, it is necessary to investigate factors that contribute to negative language learning outcomes to attempt to prevent these negative outcomes (e.g., the discontinuation of English language study). Thus, the L2 motivation literature lacks an examination of both positive and negative outcomes using a holistic framework, such as trait emotional intelligence (TEI), which includes many individual differences and may predict L2 motivation.

Literature review

Trait emotional intelligence in learning contexts

Trait Emotional Intelligence (TEI) posited by Petrides and Furnham (2001), is defined as "a constellation of *behavioral dispositions* and *self-perceptions* concerning one's ability to recognize, process, and utilize emotion-laden information" (Petrides et al., 2004, p. 278). The theory consists of fifteen factors, namely adaptability, assertiveness, emotion expression, emotion perception, emotion regulation, low impulsiveness, relationships, self-esteem, self-motivation, social-awareness, stress management, trait empathy, trait happiness, and trait optimism. These factors, contained within four larger domains, measure emotion and dispositional aspects of emotional intelligence. The four domains include emotionality, self-control, sociability and well-being; these factors encompass aspects of personality traits, emotion, motivation, and self-regulation.

Research has extensively examined the role of TEI in general learning contexts. Studies have found a positive association between TEI and positive learning outcomes among children (Mavroveli & Sánchez-Ruiz, 2011) and university students (e.g., Fernandez et al., 2012). Mavroveli and Sánchez-Ruiz (2011) found that higher TEI scores were associated with higher math scores among UK elementary school children. Fernandez and colleagues (2012) surveyed Australian nursing students and found that TEI positively predicted grades obtained after a six-month period of study.

In the field of second language acquisition, researchers have started to investigate the impact of TEI in language learning processes. With the recent positive psychological approach, some researchers have started to investigate relationships between TEI and positive and negative emotions such as learners' perceived enjoyment and anxiety. Dewaele et al. (2008) investigated three different groups of language learners (low/average/high TEI) and their levels of communicative anxiety associated with their native language and foreign language anxiety. They found that participants with high TEI had significantly lower levels of communicative anxiety and foreign language anxiety. Another study focusing on second language teachers by Dewaele et al. (2018) found that TEI measured in second language teachers was positively associated with the ability to manage classroom environments, subjective creativity, and teaching ability. Resnik and Dewaele (2020) found that TEI positively correlated with enjoyment of L1 and foreign language learning and negatively associated to anxiety. Li and Xu (2019) observed positive correlations between TEI and foreign language learning enjoyment, with a negative association between TEI and foreign language anxiety among learners in China.

Although TEI is gaining notice by some researchers in second language acquisition (SLA), research has been limited to the relationship between TEI and emotions (i.e., both negative and positive emotions). Moreover, in the area of second language learning, studies of personality traits largely supplanted the position of TEI, because TEI is thought to share many overlapping concepts with personality trait theories (van der Linden et al., 2018). Although L2 motivation research has reached a general consensus, that is motivational factors produce a positive effect on language learning outcomes (Dörnyei, 2009), research results obtained using personality perspectives in SLA are not always consistent. Therefore, using TEI would contribute to a more holistic examination of interacting and diverse second language learner outcomes by examining aspects of personality, motivation, and emotion.

Engagement, burnout, and stress in learning contexts

Fredricks et al. (2004) introduced multidimensional aspects of academic engagement stating that "The idea of commitment, or investment … is central to the common understanding of the term engagement" (p. 61). In field of SLA, researchers have focused on academic engagement (Oga-Baldwin et al., 2017) as it is positively associated with various learner factors such as motivational characteristics, academic achievement, success, school performance and is negatively associated with dropout (see Fredricks et al., 2004). Though several dimensions of engagement have been employed in the field of SLA (Hiver et al., 2021), four aspects stand out due to their connection with schooling: behavioral, cognitive, emotional, and agentic engagement.

Behavioral engagement is represented by positive participation such as making effort, paying attention, and concentration (Skinner et al., 2009). Cognitive engagement summarizes the ideas of self-regulated learning and use of learning strategies (see Wang et al., 2011). Emotional engagement describes learners' affective reactions to academic content or contexts (e.g., feeling interest and curiosity, enjoyment, satisfaction; Skinner et al., 2009). Finally, agentic engagement describes the ways in which learners proactively and intentionally contribute to the learning environment and activities (e.g., offering input or making suggestions) (Reeve, 2012).

Researchers across multiple fields including psychology, education, and SLA consider academic engagement to include both ascendent and descendent variables in learning contexts. Dincer and colleagues (2019) showed that teachers' instructional style and learners' psychological needs satisfaction positively predicted academic engagement. These researchers found that the aspects of engagement were predicted by leaners' internal psychological perceptions of autonomy, competence, and relatedness. Emotional and agentic engagement then predicted achievement, and cognitive engagement negatively predicted absenteeism. This model confirmed earlier longitudinal work (Oga-Baldwin et al., 2017; Skinner et al., 2009), which indicated that engagement has a reciprocal positive relationship with motivation, learning, and the learning environment. Skinner and colleagues (2009) importantly demonstrated how positive engagement predicts a virtuous circle moving towards more self-determined motivation and achievement, while disengagement and disaffection are part of a vicious cycle associated with lowered well-being, achievement, and potential burnout-like states.

Burnout is a multidimensional construct consisting of three domains: exhaustion, cynicism, and lack of self-efficacy (Salmela-Aro et al., 2009). Exhaustion refers to feeling overwhelmed, worried, and tired toward schoolwork. Cynicism is represented by loss of interest and lack of meaning in schoolwork. Finally, lack of self-efficacy (i.e., inadequacy) is comprised of a lower expectation of one's own schoolwork and perceived competence, or reduced feelings of accomplishment. Where engagement is the positive actions that students take toward learning, researchers specifically note burnout (and its synonym disaffection) as the theoretical opposite of engagement (Skinner & Pitzer, 2012, p. 24).

Recent research considers the role of burnout in learners, examining ways to prevention strategies in academic contexts. Though engagement has received interest in SLA (Hiver et al., 2021), its opposite side, school burnout, has not been a central focus of research beyond noting the negative relationship between the two (Zucoloto et al., 2016; Schaufeli et al., 2002). A longitudinal study with Finnish secondary students by Wang and colleagues (2015) confirmed a trade-off between emotional engagement and burnout in which students decreased feelings of enjoyment (emotional engagement) and increased feelings of being overwhelmed (burnout) over time. Furthermore, Wang and colleagues (2015) emphasized the emotional process of burnout as "conceptually mirror[ing]" (p. 58) emotional engagement.

An additional factor, that of academic stress, is often seen as a factor in burnout and disengagement. The relationship between three elements of burnout – that is, cynicism, exhaustion, and inadequacy toward learning (Salmela-Aro et al., 2009) – and academic stress has been extensively studied in various academic contexts. Studies indicate that stress is a positive predictor of experiencing burnout in academic contexts including universities (Kilic et al., 2021; Lin & Huang, 2014; etc.) and secondary schools (Salmela-Aro & Upadyaya, 2014). Stress further appears to be higher among females compared to males, and among older undergraduate students compared to students in earlier years of university (Lin & Huang, 2014). Students in the later years of Japanese higher education undergo a number of academic and non-academic trials (e.g., job hunting) that contribute to their academic stress (Hori & Nakajima, 2018); a common situation across numerous Asian countries (Liem & Tan, 2018). There is thus a high potential for risk of burnout among Japanese university students, especially those studying foreign languages (Kikuchi & Sakai, 2009).

Relationships between TEI with academic engagement, burnout, stress, and other academic performance

Past research suggests that TEI plays a positive role in predicting academic engagement, performance, outcomes, and psychological well-being in learning contexts. A study of undergraduate students found TEI to be a significant predictor of academic engagement after controlling for previous academic engagement, gender, and ability (Maguire et al., 2017). Mavroveli and Sanchez-Ruiz (2011) found that TEI was associated with better math outcomes in a sample of seven- to twelve-year-old children. TEI was also found to moderate the relationship between IQ and academic outcomes in British high school students (Petrides et al., 2004). Children with higher TEI were more socially competent, cooperative, and kind but were significantly less likely to be a victim of bullying or to bully others (Mavroveli & Sanchez-Ruiz, 2011). A study with Spanish undergraduate students by Durán and colleagues (2006) confirmed the impact of emotional intelligence on burnout and academic engagement, after controlling for perceived self-efficacy

and perceived stress; that is, they found that perceived stress was significantly associated with burnout and engagement.

Research also suggests a negative relationship between TEI and burnout. TEI has been negatively associated with depression and loneliness (Davis et al., 2019). Fiorilli and colleagues (2020) found that the relationship between TEI and burnout were mediated by anxiety in a sample of high school students. Another study examining Italian high school students also found a significant negative relationship between school burnout and TEI (Romano et al., 2020). Research examining medical students observed that TEI negatively predicted burnout and positively predicted well-being (Lin et al., 2016). Seibert and colleagues (2016) examined dispositional self-control, an aspect of TEI, finding a negative association between self-control and inadequacy, cynicism, and exhaustion.

In a hopeful turn, past work has also shown that TEI can be developed via a short training intervention. Nelis and colleagues (2011) conducted theory-based training sessions, including a short lecture, role-play, and group discussions for "understanding emotions, identifying one's own emotions, identifying others' emotions, regulating one's own emotions, regulating others' emotions, and using positive emotions to foster well-being" (p. 356). In both studies researchers were able to significantly develop TEI with increased levels of emotional intelligence remaining constant six months after TEI intervention training.

The theoretical and empirical work to date indicates potential relationships between trait emotional intelligence, stress and burnout, and engagement. At the same time, these factors have yet to be directly addressed in the literature on language education. Given the examination pressures often associated with education generally and foreign language education specifically across much of Asia (cf. Liem & Tan, 2018; Gao 2016), stress and burnout appear to be common features of language learning in these contexts (Sakai & Kikuchi, 2009). With the potential for TEI to mitigate stress and burnout, investigations into the relationships between TEI, burnout, and engagement might offer hope for trainable interventions in Asian language learning and beyond.

Research questions and hypotheses

The purpose of the present investigation was to examine the role of TEI factors (i.e., emotionality, well-being, self-control, and sociability) in predicting academic stress, burnout (i.e., cynicism, exhaustion, and inadequacy) and engagement (i.e., agentic, behavioral, emotional, and cognitive) at baseline and follow-up time points in Japanese students learning English as a second language using structural equation modeling, regression, cluster analysis and ANOVA. The following research questions and hypotheses are proposed:

RQ1. How does TEI predict stress, burnout, and engagement?
Hypothesis 1: TEI will negatively predict stress and burnout, and positively predict engagement.
RQ2. How does stress predict burnout and engagement?
Hypothesis 2: Stress will positively predict burnout; and stress will be a statistically significant predictor (either positive or negative) of engagement.
RQ3. How does burnout predict engagement?
Hypothesis 3: Burnout will negatively predict engagement.
RQ4. How do different TEI-based cluster groups demonstrate changes in academic stress, burnout, and engagement throughout the academic semester?
Hypotheses 4.1: Burnout-related factors (i.e., stress, cynicism, exhaustion, and inadequacy) will be significantly higher in participants in the low TEI cluster group compared to participants in a high TEI cluster group at both the beginning of the academic term and at the end of that academic term.
Hypothesis 4.2: Exhaustion will significantly increase in the low TEI group from baseline to follow-up but will not significantly increase between baseline and follow-up in the high TEI group.
Hypothesis 4.3: Engagement factors (i.e., agentic, behavioral, emotional, and cognitive) will be significantly higher in the high TEI cluster group compared to the low TEI cluster group at baseline and follow-up.

Materials and methods

Sample

A total of 184 undergraduate students (87 females; 91 males; 6 did not identify gender) attending a private university in Japan participated in the study. Questionnaire data collection occurred at the beginning (i.e., baseline) and end of the academic term (i.e., follow-up). Mean participant age was 19.70 years ($SD = 1.31$). Average length of English study was 9.31 years ($SD = 2.98$). One-fifth (20.5%) of participants indicated that they had studied abroad in an English-speaking country (Mean time 69.22 days, $SD = 92.77$) at a mean age of 17.41 years ($SD = 3.24$). In addition, 57.6% of participants indicated that they had visited or lived in an English-speaking country in the past for a mean of 544.82 days ($SD = 1522.15$) at a mean age of

13.05 years ($SD = 5.83$). Participants also reported spending 298.52 min on average per week ($SD = 275.73$) on courses related English study and spending a mean of 94.49 min per week ($SD = 167.72$) on English study unrelated to university course work. Research ethics approval was obtained from the "University Ethics Review Committee on Research with Human Subjects".

English ability of participants

Participants provided scores on standardized English assessments acquired since entering university. Reported scores consisted of the following tests: TOEFL iBT ($n = 25$; $Mean = 78.44$, $SD = 17.87$), TOEFL ITP ($n = 70$; $Mean = 526.23$, $SD = 35.22$), WeTEC ($n = 73$; $Mean = 730.95$, $SD = 88.82$), TOIEC ($n = 36$; $Mean = 817.36$, $SD = 85.16$), EIKEN ($n = 48$; $Mean = 1.71$, $SD = 0.34$) and IELTS ($n = 3$; $Mean = 6.16$, $SD = 0.57$). In addition, 49 participants reported Common European Framework of Reference for Languages (CEFR) scores: 2.2% reported an A2 score, 33.2% a B1 score, 34.2% a B2 score and 3.8% a C1 score.

Materials

Questionnaire survey

Questionnaires were conducted twice: once at the beginning of the academic term (i.e., baseline) and again at the end of the term (i.e., follow-up). The questionnaires were used to assess academic engagement, burnout, emotional intelligence, and academic stress using the following previously developed and validated measures:

a) Academic engagement was adapted from Skinner and colleagues (2009), Reeve (2013), and Senko and Miles (2008). The items consisted of 19 items of four subscales: behavioral engagement (5 items; "I pay attention in this class." $\alpha = 0.92$); emotional engagement (4 items; "When we work on something in this class, I feel interested." $\alpha = 0.90$); cognitive engagement (8 items; "When reading for this class, I try to explain the key concepts in my own words." $\alpha = 0.88$); agentic engagement (5 items; "When I need something in this class, I'll ask the teacher for it." $\alpha = 0.85$). The questionnaire used a six-point Likert scale.
b) Burnout was evaluated using the School Burnout Inventory (SBI; Salmela-Aro et al., 2009), which consisted of nine items consisting of three subscales, namely cynicism (3 items; "I feel that I am losing interest in my schoolwork"; $\alpha = 0.67$), exhaustion at schoolwork (4 items; "I feel overwhelmed by my schoolwork"; $\alpha = 0.80$), and sense of inadequacy at school (2 items; "I used to have higher expectations of my schoolwork than I do now"). Each item was assessed using a six-point Likert scale ranging from "Completely disagree" to "Completely agree".
c) The Trait Emotional Intelligence Questionnaire (Petrides, 2009) was used to assess emotional intelligence. The questionnaire consisted of twenty-six items using a seven-point Likert scale ranging from "Completely Disagree" to "Completely Agree". The questionnaire assessed four factors of emotional intelligence, namely self-control (6 items; "I usually find it difficult to regulate my emotions"; $\alpha = 0.70$), well-being (6 items; "I generally don't find life enjoyable"; $\alpha = 0.81$), sociability (6 items; "I can deal effectively with people"; $\alpha = 0.71$), and emotionality (8 items; "Expressing my emotions with words is not a problem for me"; $\alpha = 0.60$).
d) Academic stress was assessed using the Perceptions of Academic Stress scale (PAS; Bedewy & Gabriel, 2015). The questionnaire consisted of thirteen items using a five-point Likert scale ranging from "Strongly disagree" to "Strongly agree" ($\alpha = 0.85$; e.g., "My teachers are critical of my academic performance").

Analysis

Research questions 1–3 were answered using structural equation models presented in Fig. 1. Analyses were conducted using JASP (JASP Team, 2022). Structural equation modeling (SEM) using Maximum Likelihood estimation with bias-corrected bootstrapping of 10,000 samples was used to create a path model examining direct and indirect interrelationships among the following factors: emotional intelligence, academic stress, burnout, and engagement. Missing data was accounted for using Full Information Maximum Likelihood (FIML) estimation. RQ 4 was answered using cluster analyses and with between and within subjects ANOVA. Cluster analysis was conducted to separate participants into diverse groups based on scores of four types of TEI. Within-subjects and between-subjects ANOVA were performed to compare (1) baseline stress, burnout, and engagement and (2) follow-up stress, burnout, and engagement scores between the high TEI and low TEI groups.

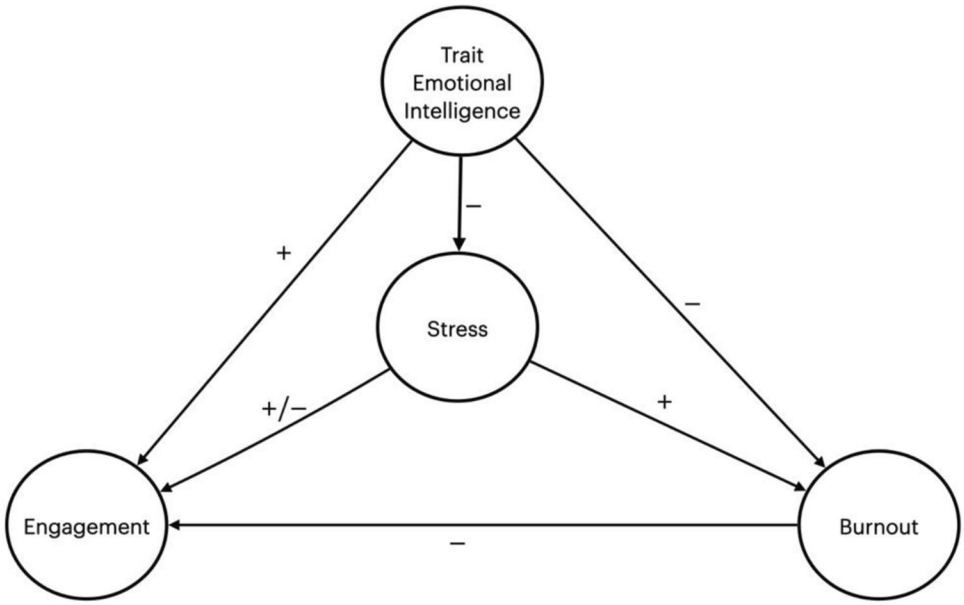

Fig. 1 Hypothesized model to be tested

Table 1 Descriptive statistics and pairwise correlations. Cronbach's alpha presented on the diagonal

	TEI	Stress	Burnout	Engagement
TEI	(0.77)			
Stress	-0.523***	(0.73)		
Burnout	-0.476***	0.823***	(0.84)	
Engagement	0.248*	-0.099	-0.226*	(0.81)
Mean	3.577	3.175	3.050	3.445
SD	0.713	0.833	1.001	0.838
95% CI	[3.47, 3.68]	[3.05, 3.30]	[2.90, 3.20]	[3.32, 3.57]

Results

Predictive model of TEI, stress, burnout, and engagement

Standardized correlation matrices and descriptive statistics for all scales are presented in Table 1. A path model (Fig. 2) was created to examine TEI, academic stress, burnout, and engagement. The bootstrapped model produced good fit (χ^2/df = 135.912/59, CFI = 0.918, RMSEA = 0.085) and the coefficients are displayed in Fig. 2. TEI negatively predicted academic stress (b = −0.52, p < .001) and positively predicted engagement (b = 0.42, p = .049), with no significant relationship with burnout (b = −0.06, p = .521), partially

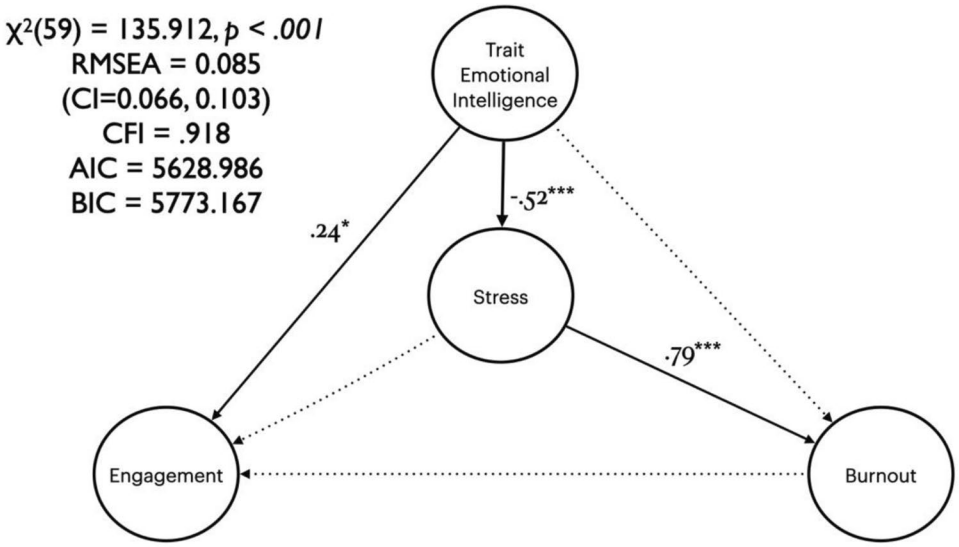

Fig. 2 Path model of trait emotional intelligence, stress, burnout, and engagement

Table 2 Mean values used for for TEI cluster analyses

	Higher TEI (n = 85)	Lower TEI (n = 93)
Emotionality	4.48	3.47
Well-being	4.53	2.97
Self-control	3.76	2.84
Sociality	3.85	2.91

confirming Hypothesis 1. Academic stress positively predicted burnout (b = 0.76, $p < .001$) but did not significantly predict engagement (b = 0.36, $p = .107$), partially confirming Hypothesis 2. Finally, burnout did not negatively predict engagement (b = − 0.41, $p = .062$) in the model, disconfirming Hypothesis 3.

TEI is associated with higher engagement and lower burnout

To identify cluster patterns of TEI in the participants, K-means cluster analyses were employed. Using K-means analysis, two different clusters were identified based on emotionality, well-being, self-control, and sociality. These generated a higher TEI group (n = 85) and lower TEI group (n = 93, see Table 2). Six participants were identified as missing data. To confirm the accuracy of the clusters, we compared clusters generated by two random subsamples with the clusters generated by the overall sample, then compared the agreement with the original using Cohen's Kappa (Breckenridge, 2000). The two cluster solutions for the overall sample and the subsamples were found to agree at Kappa = 0.82, indicating 91% agreement.

Mean comparisons were conducted to explore differences for baseline and follow-up stress and burnout scores for the high TEI and low TEI groups. Table 3 presents the summarized results. Significant differences were observed between the low versus high TEI groups' stress scores; the low TEI group reported higher stress. Significant differences were also observed between the low and high TEI groups for cynicism, with higher cynicism scores in the low TEI group. For inadequacy, participants in the high TEI group reported significantly lower scores at both baseline and follow-up time points. No within subjects differences were found for stress, cynicism, or inadequacy. Within subjects comparisons of exhaustion scores found a significant increase in exhaustion over time for the low TEI group, as well as differences between high and low TEI groups at start and finish.

Mean engagement scores were compared to examine differences between low TEI and high TEI at baseline and follow-up timepoints using both between and within-subjects ANOVA. Table 4 presents these findings. For agentic engagement, the high TEI group reported significantly higher scores at baseline and at follow-up compared to the low group. No between or within subject mean differences were observed for behavioral engagement. The high TEI group showed higher emotional engagement at follow-up compared to baseline; participants in the low TEI reported non-significant differences in emotional engagement. The high TEI group reported significantly higher emotional engagement at follow-up compared to participants in the

Table 3 Baseline/follow-up repeated measures ANOVA of burnout factors

High vs. Low TEI		*df*	*F*	*p*	η^2	High Base *m*	Low Base *m*	High Follow *m*	Low Follow *m*
Stress	Between	1, 162	23.48	< 0.001	0.10	2.86	3.40	2.87	3.51
	Within	1, 162	0.81	= 0.37	0.00	(*SD* 0.87)	(*SD* 0.81)	(*SD* 1.11)	(*SD* 0.95)
Cynicism	Between	1, 163	20.45	< 0.001	0.08	2.70	3.43	2.70	3.18
	Within	1, 163	1.28	= 0.18	0.00	(*SD* 0.99)	(*SD* 1.13)	(*SD* 1.11)	(*SD* 0.98)
Exhaustion	Between	1, 165	3.96	= 0.04	0.02	2.32	2.52	2.45	2.78
	Within	1, 165	4.09	= 0.04	0.01	(*SD* 1.16)	(*SD* 1.04)	(*SD* 0.97)	(*SD* 1.03)
Inadequacy	Between	1, 163	22.24	< 0.001	0.09	3.46	4.09	3.12	4.05
	Within	1, 163	3.10	= 0.08	0.00	(*SD* 1.25)	(*SD* 1.32)	(*SD* 1.22)	(*SD* 1.31)

Table 4 Pre-post ANOVA mean comparisons of engagement aspects

High vs. Low TEI		*df*	*F*	*p*	η^2	High Base *m*	Low Base *m*	High Follow *m*	Low Follow *m*
Agentic	Between	1, 165	10.26	< 0.01	0.04	2.39	1.93	2.37	2.01
	Within	1, 165	0.13	= 0.72	0.00	(SD 1.00)	(SD 0.85)	(SD 1.03)	(SD 1.04)
Behavioral	Between	1, 165	1.06	= 0.31	0.00	4.12	3.99	4.04	3.88
	Within	1, 165	1.36	= 0.25	0.00	(SD 1.00)	(SD 1.08)	(SD 1.02)	(SD 1.04)
Cognitive	Between	1, 165	1.27	= 0.26	0.00	3.78	3.57	3.88	3.65
	Within	1, 165	3.06	= 0.08	0.00	(SD 0.96)	(SD 0.98)	(SD 1.02)	(SD 0.91)
Emotional	Between	1, 165	6.92	< 0.01	0.03	3.71	3.41	4.05	3.56
	Within	1, 165	9.06	< 0.01	0.01	(SD 1.08)	(SD 1.12)	(SD 1.13)	(SD 1.09)

low TEI group. Finally, non-significant differences were obtained for all comparisons of cognitive engagement.

Discussion

The current investigation examined to what extent dimensions of TEI predicted academic engagement, perceived stress, and burnout among second language learners.

RQ1: *How does TEI predict stress, burnout, and engagement?*

As predicted, the structural model indicated that TEI factors positively predicted engagement and negatively predicted stress but did not directly relate to burnout. This partially confirmed Hypothesis 1, and indicates how students who indicate higher sociability, self-control, well-being, and emotionality appear more able to handle stressors. While TEI did not show a direct relationship with burnout, its indirect role in mitigating stress makes it nonetheless a key variable for study.

RQ2. How does stress predict burnout and engagement?

In partial confirmation of Hypothesis 2, stress positively predicted burnout, but did not significantly predict engagement. This finding runs counter to arguments for stress as a potentially positive influence in the classroom, and indicates that stressors, such as criticism, might contribute to students' later feelings of cynicism, inadequacy, and exhaustion. Results were consistent with previous research in diverse settings (Kilic et al., 2021; Lin & Huang, 2014) which has shown that stress often accompanies feelings of cynicism, exhaustion, and inadequacy.

RQ3. How does burnout predict engagement?

Contrary to Hypothesis 3, burnout did not have any direct predictive effect on engagement. Though prior conceptualizations indicate burnout and disaffection as the opposite of engagement (Skinner & Pitzer, 2012), the current findings align with more current theorization that burnout may operate on a separate vector from perceptions of their behavior, cognition, emotion, and agency in classroom learning (Reschly & Christenson, 2022).

The current models show how stress mediated the effect of TEI on burnout. In SLA, many studies employed anxiety as a predictor, criterion, or mediating variable. Therefore, the current results suggest that perceived stress may be an alternative subscale that could be utilized as a predictor or criterion when considering the interaction between TEI and burnout in the current investigation.

RQ4. How do different TEI-based cluster groups demonstrate changes in academic stress, burnout, and engagement throughout the academic semester?

The baseline and follow-up measurements revealed that high TEI participants reported lower academic stress, cynicism, exhaustion, and inadequacy compared to low TEI participants. Higher TEI participants reported significantly higher emotional and agentic engagement compared to low TEI participants. In addition, comparing burnout scores at the beginning and end of the semester revealed that exhaustion significantly increased for low TEI participants, however inadequacy significantly decreased over the term for high TEI participants. For engagement, high TEI participants reported significantly higher emotional engagement at the end of the term compared to the beginning of the term indicating that engagement increased over the term for high TEI participants.

Theoretical and practical implications

Our findings show how the relationship of trait emotional intelligence as a negative predictor of stress, and confirm the predictive relationship between stress and burnout. From a practical perspective, these results indicate how TEI may help to mitigate the negative effects of stress and in order to (indirectly) improve engagement. This finding would indicate a role for teacher attention to emotionality, self-control, sociality, and well-being in the classroom. Given the potential for emotional intelligence as a trainable construct (Nelis et al., 2011), implementing TEI training sessions might facilitate academic engagement and help prevent burnout.

This finding is also confirmatory of theory; self-determination theory (Ryan & Deci, 2017), the L2 Motivational Self-System (Dörnyei, 2009), and other motivational perspectives emphasize a role for well-being and positive social relationships for promoting positive engagement and learning. These data show how TEI may improve learning in foreign language classrooms.

Consistent with prior findings (Wang et al., 2015), our results showed that both burnout or academic engagement are not stable but fluctuate over time. Furthermore, the fluctuation processes of burnout and academic engagement differed depending on trait emotional intelligence. The higher TEI group showed an increase in emotional engagement and a decline of feelings of inadequacy, while the low TEI group experienced an increase of exhaustion during the semester. Moreover, the high TEI cluster group showed higher levels of engagement compared to participants in the low TEI

group at both time points, and displayed lower levels of stress and burnout.

These results further offer implications for language education in Asia. Representing a Japanese sample, these findings imply that tertiary language learners in similarly industrialized Confucian countries (e.g., South Korea, China, etc.) are vulnerable to stress and burnout, but that trait emotional intelligence may help promote engagement in samples of this type.

Limitations and future directions

Despite these findings, several limitations should be noted. Firstly, though bootstrapping methods were employed to counteract sample size effects, the current sample size should be increased in future studies to strengthen conclusions (i.e., increase statistical power). Secondly, observing students for one academic semester may not be sufficient to observe potential fluctuations in the behaviors measured in the current study. Indeed, longitudinal studies observing behavioral changes may last from half a year to several years. Despite these limitations, the current study made several important contributions to the field of second language learning. Specifically, the current study lends evidence that TEI plays a significant role in explaining interacting relationships among burnout, stress and engagement. Finally, the current study did not specifically consider the role of physical learning environments and global stressors which may also influence student stress levels (cf. Ramkissoon, 2021).

Regarding future directions, because TEI is a relatively new framework in this area of research it is necessary to see possible interactions between TEI and other L2 motivation theories such Self-Determination Theory (Ryan & Deci, 2017) and the L2 motivational self-system (Dörnyei, 2009) to connect TEI to larger language learning contexts and theories. Research continuing the use of pedagogical interventions aimed at developing TEI (Nelis et al., 2011) are needed to examine and develop TEI programs to potentially improve classroom engagement and mitigate stress and burnout, first in Japan and other Asian countries and then in more diverse language education settings.

Conclusion

Based on the current findings, burnout appears to be an opposite factor of engagement and when examining the interplay between TEI, burnout and engagement - stress played a significant role. Over the course of an academic semester, higher TEI contributed to an increase in engagement while predicting a decrease in stress. By improving Asian language learners' self-control, emotionality, well-being, and sociality in language classrooms, teachers may be better able to prevent the maladaptive cycle of stress that lead to burnout, while promoting the type and quality of engagement necessary for positively adaptive learning.

Authors' contributions KM: Planning, data gathering, modeling, writing, analysis, project direction. MSM: Planning, instrument translation, writing, analysis, data gathering. WLQOB: Analysis, writing.

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Data availability The datasets generated during and/or analysed during the current study are not publicly available due to privacy concerns, but are available from the corresponding author on reasonable request.

Declarations

Conflict of interest All authors declare that they have no conflicts of interest.

Ethical approval Research ethics approval was obtained from the "University Ethics Review Committee on Research with Human Subjects."

Informed consent Informed consent was obtained from all individual participants included in the study.

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