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The predictive effects of classroom environment and trait emotional intelligence on Foreign Language Enjoyment and Anxiety

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1. Introduction

Emotion has long been neglected as an irrational factor in SLA research with the only exception of language anxiety (Dewaele & Li, 2020). However, there has been a robust increase in attention to diverse emotions in L2 settings since the study by Dewaele and MacIntyre (2014) situated within the Positive Psychology movement in SLA (Dewaele, Chen, Padilla, & Lake, 2019a; MacIntyre & Mercer, 2014). More specifically, inspired by its broaden-and-build theory (Fredrickson, 2001), SLA researchers have become increasingly convinced of the pivotal and distinctive role of emotions in learning as well as in well-being (MacIntyre & Gregersen, 2012). The emotion spectrum has thus been stretched largely beyond anxiety to include

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enjoyment, love, pride, hope, guilt, shame, boredom, anger, frustration, and others (e.g., Kruk & Zawodniak, 2018; MacIntyre et al., 2019; MacIntyre & Vincze, 2017; Teimouri, 2018).

Of note, Foreign Language Enjoyment and Anxiety have jointly captured considerable attention for their significant consequences for L2 outcomes (e.g., Li, Jiang, Dewaele, 2019; Jin & Zhang, 2018). They were metaphorically conceptualized as the emotional feet of every L2 learner for their pervasiveness in L2 learning context (Dewaele & MacIntyre, 2016). A few studies have revealed that the variances in the experiences of FLE and FLA could be attributed to either learner-internal factors (e.g., TEI: trait emotional intelligence) or learner-external factors (e.g., teacher factors, peer factors or the overall classroom environment) (e.g., Dewaele, Witney, Saito, & Dewaele, 2018; Jiang & Dewaele, 2019). However, it remains underexplored whether and how individual and environmental factors are combined and have joint effects in predicting FLE and FLA. Such research is worthwhile because it may provide a fuller understanding of L2 emotions by considering a L2 learner in context and shed some original insights into L2 emotion intervention. The present study seeks to investigate how an individual difference (ID) factor (i.e., TEI) and an environmental factor (i.e., CE: classroom environment) individually and jointly predict FLE and FLA in two Chinese L2 contexts (i.e., high school and university).

2. Literature review

2.1. Foreign Language Enjoyment and Anxiety and their learner-internal and learner-external factors

It is safe to say that Foreign Language (Classroom) Anxiety (FLA) has been the most extensively studied emotion in SLA research, which has been traditionally dominated by cognition (Dewaele, Magdalena, & Saito, 2019; Dewaele & Li, 2020). However, the past decade has witnessed an affective turn where research into diverse emotions is blooming, such as enjoyment, love, pride, hope, joy, guilt, shame, anger, and boredom (e.g., Elahi Shirvan & Taherian, 2018; Li, Dewaele, & Hu, 2020; MacIntyre et al., 2019; Pawlak, Kruk, Zawodniak, & Pasikowski, 2020; Teimouri, 2018).

FLE and FLA have been the most attention-grabbing combination in the affective turn during the past decade (Teimouri, 2018). The study by Dewaele and MacIntyre (2014) was the first look at the two. Following the broaden-and-build theory of Positive Psychology (Fredrickson, 2003), Dewaele and MacIntyre (2014) maintained that positive emotions and negative emotions coexist in daily experiences and function distinctively from each other. Empirically, in the FL context, enjoyment was chosen as a positive counterpart of the extensively-studied negative emotion of FLA mostly because it is a core component of the foundation concept of positive psychology, i.e., flow (Dewaele & MacIntyre, 2014). According to the data of 1746 multilinguals from more than 90 countries, the two emotions were confirmed to co-exist and be negatively related to each other. Yet, this does not necessarily mean that the two emotions were at the two opposite ends of the same dimension or that the presence of one leads to the absence of the other. Instead, they are two separate emotions.

Moreover, Dewaele and MacIntyre (2014) developed the *Foreign Language Enjoyment Scale (FLES)* based on the Interest/Enjoyment subscale of Ryan, Connell, and Plant (1990). The 21 items of the FLES reflect various facets of enjoyment including creativity, interest, feeling of meaning, pride, happiness, and fun. The items are organized around the learner and the FL environment in which he or she is situated (i.e., teacher and peers). In other words, FLE is not only a subjective emotional experience, but also a socially constructed emotion, addressing its environmental factor (Li, Jiang, & Dewaele, 2018).

The FLES has been widely applied, truncated and translated into various languages in diverse L2 contexts (e.g., Li et al., 2018; Jin & Zhang, 2018; Saito, Dewaele, Abe, & In'nami, 2018). In line with Seligman and Csikszentmihalyi (2000), Dewaele and MacIntyre (2016) differentiated enjoyment from pleasure. Specifically, pleasure is a positive feeling occurring in a hedonic state when homeostatic needs are met, while enjoyment stretches beyond these homeostatic limits to accomplishing something novel and challenging. In other words, enjoyment is highly related to "a sense of novelty and accomplishment", which may be conducive to fostering personal well-being as well as long-term development (Seligman & Csikszentmihalyi, 2000).

In terms of the role of enjoyment in L2 learning, underpinned by the broaden-and-build theory (Fredrickson, 2003), MacIntyre and Gregersen (2012) argued that enjoyment is facilitative in broadening learners' thought-action repertoire to absorb more in language learning and helping them build language resources. In addition, based on the control-value theory (Pekrun, 2006), FLE is a positive achievement emotion with high activation arising from ongoing learning activity or task. It has positive consequences for various L2 learning outcomes including L2 motivation, engagement, as well as learning achievement (Dewaele & Li, 2020; Li, 2020a).

Starting from this very first study on FLE by Dewaele and MacIntyre (2014), many SLA researchers delve into the combination of the two emotions (e.g., Li, 2020a; Dewaele & Dewaele, 2018; Elahi Shirvan & Taherian, 2018; Jiang, 2020). A long list of learner-internal and learner-external factors have been identified to be significant predictors of both emotions. The first study to do this was by Dewaele et al. (2018). They found that the FLE and FLA of 189 high school students in the UK could be linked to learner-internal variables (e.g., age, gender, attitudes towards the FL, relative standing among peers, and FL proficiency level) and learner-external/teacher variables (e.g., attitudes towards the FL teacher, teacher's FL use and predictability). In a Chinese EFL context, based on 64 senior high school students' responses to the open question on FLE experiences, Li et al. (2018) also identified multiple learner-internal and learner-external sources for FLE. Learner-internal sources include a sense of progress, achievement especially in challenging tasks, a pride of pushing one's limits, the experience of novelty and perceived controllability towards the input or ongoing tasks. Learner-external sources involve various facets of teacher and peers, such as teacher recognition, support and practices, group cohesion, and engaging social activities in class. In another

study in a Chinese EFL context, using a mixed methods approach among a sample of 564 undergraduates, Jiang and Dewaele (2019) revealed that FLE was more likely to be evoked by teacher-related factors (e.g., attitudes towards the teacher, teacher friendliness, strictness and predictability), while FLA was more strongly predicted by learner-internal variables (e.g., English proficiency, relative standing among peers, and attitudes towards English). Similar findings were obtained among a group of 210 EFL learners in Spain in the study by Dewaele, Magdalena, & Saito, 2019: Teacher-related variables (e.g., teacher friendliness, strictness, accent and FL use) predicted FLE much more than FLA. All these findings converge to highlight that both learner-internal and learner-external factors play a role in shaping FL learners' FLE and FLA, echoing the fashion of context-dependent IDs research (Dewaele, 2009; Gkonou, 2017; Joe, Hiver, & Al-Hoorie, 2017). In other words, a person-in-context view should be adopted in emotion research as well.

2.2. Classroom environment and its links with emotions in L2 class

Classroom environment (CE) refers to "the atmosphere, ambiance, tone, or climate that pervades the particular educational setting" (Dorman, Fisher, & Waldrip, 2006, p.2). Numerous studies have supported CE as a significant determinant in learning (Darrell & Swe, 2006; Fraser, 1994; Jennings & Greenberg, 2009). Accumulating evidence has shown that students' perceptions of CE explain an appreciable amount of variance in the learning process (e.g., what is happening and how students think, feel and behave in class) and in various outcomes, especially cognitive and affective outcomes, sometimes even beyond the variance attributable to students' IDs characteristics (Chiew & Swe, 2002; Joe et al., 2017). Teacher, peers, self, and the content are the primary elements co-establishing CE (Holley & Steiner, 2005). Fraser, Treagust, and Dennis (1986) claimed that a positive CE is characterized by student cohesiveness, teacher support, self-involvement, investigation, task orientation, cooperation and equity.

Despite the multitude of research on the construct and an array of measurements of CE, there is a consensus that its psychosocial dimensions should be the research focus (Dorman et al., 2006). Emotion and classroom relationships (i.e., teacher-student relationships and peer relationships) have long been recognized as two central features of CE (Harvey, Bimler, Evans, Kirkland, & Pechtel, 2012). Positive CE is a positive emotional tone linked to friendliness, caring, encouragement, cooperation, cohesiveness, mutual support and respect, appropriate competitiveness, and positive interactions (Harvey et al., 2012). Patrick, Kaplan, and Ryan (2011) posited three dimensions as part of the social climate: teacher academic, emotional support and mutual respect in the classroom.

The key role of teacher in creating a healthy and positive classroom climate is evident. Hamre and Pianta (2007) argued that a positive CE permeated a classroom if the teachers were sensitive and responsive to students' academic and emotional needs, trying to establish warm, congenial, caring and nurturing bonds with students, showing sympathy and reckoning with students' perspectives, and withholding taunting, judgmental behaviors and harsh disciplines. In contrast, a negative CE was more likely to be created by teachers with little connection with, regard, care and respect for students, drawing upon harsh practices such as sarcasm, humiliation, threat, or even physical punishment. These teachers were ignorant of students' cognitive abilities, emotional dynamics, and perspectives when they designed or had lectures. Jennings and Greenberg (2009) further pointed out that teachers with a high social and emotional competence and well-being were more likely to establish and maintain teacher-student rapport and create positive CE that is conducive to promoting learning and student development. Dovetailing with these claims, in the study of 129 adult ESL/EFL students across the world, Moskowitz and Dewaele (2019) found that happier L2 teachers were more likely to create a happier class for students.

The close link between CE and emotion has been revealed. Previous studies have uncovered the reciprocity between the two. As claimed, the emotional experiences of the teacher and the students in class collectively and cumulatively contributed to the establishment of CE, which in turn set a tone influencing emotion perception, experience and expression (Hamre & Pianta, 2007). Positive CE was linked to positive affective outcomes, including interest, enjoyment, emotional competence, motivation, comfort, positive attitudes towards the subject and engagement, while negative CE to negative ones including anxiety, frustration, discomfort, confusion, aggression and other emotional difficulties (Dorman & Fraser, 2009; Harvey et al., 2012; Reyes, Brackett, Rivers, White, & Salovey, 2012).

In the field of SLA of our interest, a few researchers have attended to CE (e.g., Khajavy, Ghonsooly, Hosseini Fatemi, & Choi, 2016; Peng & Woodrow, 2010), and more specifically its significant effect on L2 emotions. For example, among a sample of 783 Chinese university students learning English as their major, Xia and Xu (2018) found that students tended to experience negative emotions including anxiety, boredom, guilty, and helplessness when they were in a negative CE characterized by perceived negative teacher feedback, unsatisfied autonomy, tense competitiveness, poor teacher-student relationships, low textbook quality, high teacher expectation, and ill-structured teaching design. Among a sample of 1528 Iranian learners of English at the secondary level, Khajavy, MacIntyre, and Barabadi (2018) found that a positive CE was linked to fostering student enjoyment and willingness to communicate (WTC) while reducing anxiety. More specifically, students enjoyed more, felt less anxious and had more WTC when they had positive perceptions of CE characterized by emotional support, instructional support, and well-structured classroom organization. Not surprisingly, positive feelings such as enjoyment, comfort, and interest are easily evoked in a positive psychosocial climate, while negative feelings such as anxiety arise easily in a negative one which is threatening, risky, daunting or harsh.

2.3. Trait emotional intelligence and its links with emotions in L2 class

Emotional intelligence (EI) is a core ID relating to how people perceive, understand, regulate, utilize, express and generate their own and others' emotions (Li et al., 2018; Mayer & Salovey, 1997). There are two opposing definitions of EI: (1) trait EI (TEI), a personality trait constellating emotion-related dispositions and self-perceptions, usually assessed through self-reported scales; (2) ability EI, referring to one's actual emotion-related skills and competencies, which is usually measured through performance tasks, akin to those in cognitive ability tests (Petrides & Furnham, 2001).

In the past three decades, EI has captured considerable scholarly attention in general psychology and education research for its positive consequences for various human functioning, including human development, success and well-being (Allen, MacCann, Matthews, & Roberts, 2014; Goleman, 1995). EI has been shown as a robust predictor of educational achievement as well as mental health across multiple educational contexts (e.g., Li et al., 2018; Petrides, Frederickson, & Furnham, 2004).

In the field of SLA, a few researchers have shown their interest in this crucial learner-internal/ID factor and examined its predictive role in L2 achievement as well as L2 emotions. For example, in the pioneering study of 464 multilinguals by Dewaele, Petrides, and Furnham (2008), TEI was found to be linked to reducing language anxiety. In another study of 510 Chinese students' undergraduates, Shao, Yu, and Ji (2013) revealed the main effects of TEI on FLA as well as on EFL achievement, indicating that students with higher TEI tended to feel less anxious and achieve more in EFL learning. Extending Shao et al.'s (2013) findings, focusing on 1307 Chinese senior high school students, Li (2020b, 2020c) probed the links between TEI and achievement as well as three different kinds of L2 emotions, i.e., FLE, FLA, and burnout. Her results showed that TEI positively predicted L2 achievement and FLE, and negatively predicted FLA and burnout. Furthermore, in the recent study by Li & Xu, 2019, a six-week TEI intervention was conducted among 56 Chinese secondary students from a boarding school. The intervention was based on the "Three Activities" drawn from Positive Psychology and the proposed "ARGUER" model consisting of six dimensions, namely "Awareness, Recognition, Generation, Utilization, Expressing, and Regulation" of emotions. The intervention turned out to be effective not only in bolstering TEI, but also in boosting FLE and reducing FLA, providing further evidence that TEI has robust effects on L2 emotions.

In sum, previous research has found the links between TEI and learners' FLE and FLA. However, to our best knowledge, no research to date has taken a context-dependent approach to the effect of TEI on the two emotions. The present study thus aims to investigate how the learner-internal factor of TEI predicts the two emotions considering the presence of the effect of the environmental factor. Our study contributes to this growing interest in the interaction of learner-internal and learner-external factors (e.g., Dewaele et al., 2018; Khajavy et al., 2016), and more specifically may provide a better understanding of how a learner-internal ID factor and the surrounding environment co-work to shape emotion experiences in L2 classroom settings.

3. Research questions

Based upon the literature, we can infer that L2 learners' emotional experiences can be attributed to both the situational attribute of CE and the ID attribute of TEI. In the present study, we take a person-in-context approach to the understanding of L2 emotional experience. More specifically, this study seeks to investigate not only the individual effects of TEI and CE on FLE and FLA, but also the combined effects of the person-situation factors on the two prevalent emotions at different age groups. The person-environment approach is needed and warranted to provide a better account of L2 emotions. The following two research questions (RQs) were addressed among two large samples of EFL learners in China, namely senior high school students and university students.

RQ1: What are the independent effects of classroom environment and trait emotional intelligence on FLE and FLA among secondary and university students?
RQ2: What are the joint effects of classroom climate and trait emotional intelligence on the two emotions among the two samples?

4. Methods

The two research questions were addressed in two samples: senior high school students and university students in China.

4.1. Participants

Altogether, 1718 secondary students and 1295 university students participated in the study. The secondary students were all in Year 2 and recruited from 34 classes of three senior high schools in the same province in mainland China. The three schools were at different academic levels and of different types (one public school at the provincial level, one public school at municipal level, and one private school). There were 895 (52.10%) males and 823 (47.90%) females. The average age was 16.81 ($SD = 0.77$). A total of 967 (56.28%) participants were from Humanity and Social Sciences (English, Chinese, Maths, History, Politics, and Geography), while the rest were from Natural Sciences (English, Chinese, Maths, Chemistry, Physics, and Biology).

They used the same English textbook and followed the same curriculum released by the Ministry of Education of the People's Republic of China.

The 1295 university participants were from 58 classes of 11 universities in different regions of mainland China and at different academic levels. There were 287 (22.2%) males, 959 (73.1%) females and 49 (3.8%) preferred not to disclose their gender. The average age was 18.61 ($SD = 0.95$) (13 of them didn't provide their age information). There were 823 (63.55%) freshmen, 392 (30.27%) sophomores, 5 (0.38%) juniors and 3 (0.23%) seniors. They were non-English majors from more than 40 different disciplines of humanities, social sciences and natural sciences including Chinese, Accounting, Psychology, Chinese, Information Science, Chemistry, Biology, and Math. None of the participants have experiences of studying abroad.

4.2. Instrumentation

Composite questionnaires were adopted to measure the variables in discussion. All the scales used among the secondary students were full-version scales. However, for the university participants, who were participating in a larger project addressing a larger number of variables, short forms of these scales were used on the account of the length of the composite questionnaire. All the scales were translated into Chinese by a Ph.D. student in applied linguistics and checked by two professors in applied linguistics and psychology. Disagreement was settled after further discussion. The scales are detailed below.

4.2.1. Classroom environment (CE)

In the sample of the secondary students, CE was measured using Aldridge et al.'s (1999) adapted version of Fraser et al.'s (1986) *What Is Happening in This Class (WIHIC) Questionnaire***.** The instrument was reformulated in this study to better fit the current L2 contexts. For instance, "I discuss ideas in [*English*] class", and "The [*English*] teacher asks me questions". The adapted WIHIC measures seven factors including *Student cohesiveness, Teacher Support, Involvement, Investigation, Task Orientation, Cooperation,* and *Equity*. It consists of 56 items responded to on a 5-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree". The L2-contextualized scale shows extremely high reliability (Cronbach's alpha = .951, $N_1 = 1718$).

In the sample of university students, CE was measured using the shortened and L2-contextualized version of WIHIC adapted by Peng and Woodrow (2010). The short form consists of 13 items measuring three dimensions, namely *Teacher Support, Student Cohesiveness,* and *Task Orientation*. The items are arranged on a 7-point Likert scale ranging from "1 (completely disagree)" to "7 (completely agree)". The short form has been validated in a sample of Chinese university students in EFL settings, showing satisfactory reliability (Cronbach's alpha = .88, $N_1 = 579$; Peng & Woodrow, 2010). In the present sample, the short form also shows high reliability (Cronbach's alpha = .931, $N_2 = 1295$).

We made this instrumental choice also based on practicability. We used the full version of WIHIC (56 items) among secondary participants, which requires more time correspondingly, while the shorter version of WIHIC (13 items) was used among university students, which requires less time. As the use of mobile phones on campus was forbidden for the participating secondary schools, the composite questionnaire in traditional pen-and-pencil format was administered to the participants in the classroom situation, and more specifically during evening class (a typical self-taught class with no lecture in China), suggesting that the participants had more time to fill in the questionnaires. In contrast, for the university participants, online questionnaire was administered to them during 5-10-min breaks, indicating that long scales may interrupt the class and thus unacceptable. In addition, the short version adapted by Peng and Woodrow (2010) has been used and validated in the same Chinese EFL context, which may better fit in the present study.

4.2.2. Trait emotional intelligence (TEI)

For both samples, *Trait Emotional Intelligence Questionnaire – Short Form* (TEIQue–SF) (Petrides, 2009) was used to measure TEI. The TEIQue–SF is a short form of the full version of TEIQue which consists of 153 items (Petrides et al., 2004). The TEIQue–SF contains 30 items measuring 15 facets and five factors (namely *Emotionality, Self-Control, Sociability, Well-Being and Other Facet*). All the items are arranged on a 7-point Likert scale, ranging from "1 (Disagree completely)" to "7 (Agree completely)". The instrument showed acceptable reliability in both samples (Cronbach's alpha = .796, $N_1 = 1718$; Cronbach's alpha = .838, $N_2 = 1295$).

4.2.3. Foreign Language Enjoyment (FLE)

In both samples, FLE was measured with the *Chinese version of Foreign Language Enjoyment Scale* (CFLES) (Li et al., 2018). It was adapted from the *Foreign Language Enjoyment Scale* (Dewaele & MacIntyre, 2014). It measures three dimensions including *FLE-Private, FLE-Teacher* and *FLE-Atmosphere* with 11 items. The CFLES was answered on a 5-point Likert scale and a 7-point Likert scale respectively among the secondary and university students. In both datasets, the *CFLES* showed satisfactory reliability (Cronbach's alpha = .826, $N_1 = 1718$; Cronbach's alpha = .868, $N_2 = 1295$).

4.2.4. Foreign language anxiety (FLA)

The FLA was measured using the *Foreign Language Classroom Anxiety* (FLCAS) (Horwitz, Horwitz, & Cope, 1986). It was originally developed to measure FL-specific anxiety. It is generally considered as having a one-factor structure measuring three different kinds of anxiety: 1) communication anxiety, 2) fear of negative evaluation, and 3) test anxiety (Horwitz, 2017).

It consists of 33 items. The FLCAS was answered on a 5-point Likert scale and a 7-point Likert scale respectively among the secondary and university students. The FLCAS showed high reliability in the sample of secondary students (Cronbach's alpha = .826, $N_1 = 1718$; Cronbach's alpha = .942, $N_2 = 1295$).

4.3. Data collection and process

A convenience sampling was adopted to recruit secondary and university participants. To obtain the sample of senior high school students, the first author contacted school principals, headmasters, and English teachers in four schools and got consent from three. Students were administered the composite questionnaires in a paper-and-pen format in the classroom situation to enable more participation. Before filling in the questionnaire, they were informed of the nature of the study, their rights not to participate, and to withdraw at any time without any consequences. They were also assured of the confidentiality of their data and the limited use of the data only for research purposes. The data collection started in April and ended in May 2017.

The data obtained from the secondary students using the questionnaire survey in pen-and-paper format were first digitized to be computer-readable. The data of 118 participants were then discarded because they provided either incomplete or strait-line responses. The final valid data consisting of the 1718 participants' responses were finally analyzed (Pearson correlation and regression analyses) to address the RQs using SPSS 19.

To obtain the sample of university students, the research team contacted their colleagues and requested them to invite their students to participate in the online questionnaire survey. The participants were also well-informed of the nature of the survey as well as their unconditional rights of non-participation, withdrawal, and data confidentiality before they filled the questionnaire. The data collection was conducted in October 2018.

The data of the university participants were retrieved from forced-choice online questionnaires, with few missing values. Pearson correlation and regression analyses of the 2268 participants' responses were conducted in response to the RQs using SPSS 19.

5. Results

Descriptive analyses were conducted for all the variables under discussion. The results are displayed in Table 1. Normality tests were also conducted. The Skewness and Kurtosis in Table 1 indicate that the total scores of all the variables in both samples were normally distributed, enabling subsequent parametric tests.

5.1. The correlation between classroom climate, trait emotional intelligence, Foreign Language Enjoyment and Anxiety

In order to address the first RQ, a series of Pearson Correlation analyses were conducted between each of the two variables in discussion. The results are provided in Table 2.

According to Table 2, CE was found to be positively related to FLE with a large effect size in both samples, while negatively to FLA with a medium effect size among secondary students and a small effect size in university students, following the benchmark of effect size proposed by Plonsky and Oswald (2014). This indicates that students who perceived their English class environment as more positive tended to enjoy more and feel less anxious in English learning, and vice versa.

Individual TEI was found to be positively related to FLE, while negatively to FLA, with a medium effect size for both samples. This suggests that at both educational levels, those students who were more emotionally aware and competent tended to experience more enjoyment and less anxiety in English learning and vice versa.

Small to medium correlation was found between FLE and FLA in the two samples, indicating that students who enjoyed more in English learning tended to feel less anxious in English learning.

Table 1
Descriptive analyses of classroom climate, trait emotional intelligence, Foreign Language Enjoyment and Anxiety in two samples.

	Variable	Item Number	Possible Range	*M*	*SE*	Observed Range	Skewness		Kurtosis		Cronbach α
Sec.	CE1	56	56–280	159.46	.479	66–280	.104	.059	.489	.118	.951
$N_1 = 1718$	TEI1	30	30–210	134.89	.431	54–198	-.073		.524		.796
	FLE1	11	11–55	34.35	.168	11–55	-.294		.656		.826
	FLA1	33	33–165	100.19	.479	35–164	-.050		.194		.920
Uni.	CE2	13	13–91	73.79	.337	26–91	-.501	.068	-.081	.136	.931
$N_2 = 1295$	TEI 2	30	30–210	140.29	.533	66–194	.236		.133		.838
	FLE2	11	11–77	55.61	.279	11–77	-.136		.047		.868
	FLA2	33	33–231	134.72	.918	44–225	-.075		-.001		.942

Note: Sec. = secondary school students, Uni. = university students.

Table 2
Correlation between classroom climate, trait emotional intelligence, Foreign Language Enjoyment and Anxiety in two samples.

Sec. $N_1 = 1718$	CE1	TEI1	FLE1	FLA1	Uni. $N_2 = 1295$	CE2	TEI2	FLE2	FLA2
CE1	–				CE2	–			
TEI1	.400[a]	–			TEI2	. 510[a]	–		
FLE1	.563[a]	.313[a]	–		FLE2	. 675[a]	.440[a]	–	
FLA1	-.370[a]	-.389[a]	-.438[a]	–	FLA2	-.242[a]	-.440[a]	-.383[a]	–

[a] Correlation is significant at the 0.01 level (2-tailed).

5.2. Joint effects of classroom environment and trait emotional intelligence on Foreign Language Enjoyment and Anxiety

Table 2 presents the separate effects of a contextual factor (CE) and an individual factor (TEI) on two emotions, FLE and FLA. Following the wave of investigating learner-internal and learner-external factors of emotion (Dewaele et al., 2018), the combined effects of CE and TEI were further examined. CE and TEI were entered simultaneously into a regression model as co-predictors, with FLE and FLA being outcome variables respectively. The results for the two models are presented in Table 3 and Table 4.

According to Table 3, the model encompassing FLE and its learner-internal and learner-external antecedents (i.e., TEI and CE) was an excellent fit of the data for both samples. Furthermore, in both samples at different educational levels, CE and TEI co-predicted FLE and the predictive effect of CE outweighed that of TEI. This indicates that FLE might arise as a result of the joint effects of the contextual factor of CE and the individual factor of TEI and that the former played a larger predictive role.

According to Table 4, the model was also well supported. In both samples, CE and TEI co-predicted FLA. For secondary students, after entering the same regression model, the effect of CE diminished to small to medium size and was slightly smaller than that of TEI. For university students, the effect of CE diminished greatly to be insignificant (indicated by the p value as well as the confidence interval which straddles zero), while the effect of TEI on FLA remained significant within a medium size. This indicates that at both secondary and tertiary levels, FLA were experienced as a joint result of the external CE and students' TEI. In addition, individual TEI played a larger role among university students than among the secondary students.

6. Discussion

6.1. The independent effects of classroom climate and trait emotional intelligence on FLE and FLA among secondary and tertiary students

The first RQ addressed the main links between CE, TEI and FLE and FLA. Our findings show that the two emotions were linked to both an individual's personality factor of TEI and the overall classroom environment.

In line with the literature (Khajavy et al., 2018; Xia & Xu, 2018), CE had profound predictive effects on L2 emotions, suggesting that L2 students tended to enjoy more and feel less anxious in a positive classroom atmosphere. This could be explained as follows. Positive perceptions of classroom environment arise jointly from desirable teacher characteristics, peer characteristics, self-characteristics and their interactions, characterized by peer and teacher support, engagement, equity, task orientation, cooperation and exploration at class level (Aldridge et al., 1999; Fraser et al., 1986; Peng & Woodrow, 2010). These positive perceptions contribute to creating a safe psychosocial base or space for L2 learning, especially creative L2 explorations (Dewaele & MacIntyre, 2014), allowing students to enjoy more by engaging more, exploring more, and sharing more. This kind of environment also secures students with minimal risks in participation, thus reducing their chances of feeling anxious as being at the hands of the teacher or at the hands of peers (Barrett, 2010).

The links between CE and FLE and FLA also highlighted the social nature of L2 emotions. The strong link between CE and FLE corroborates the environmental dimension of FLE as proposed by (Dewaele & MacIntyre, 2014). As Li et al., 2018 claimed, L2 emotions were not only subjectively experienced, but also socially constructed. It is true that "academic learning and teaching are situated in social contexts" (Pekrun & Linnenbrink-Garcia, 2014, p.5). Students never learn in a social vacuum,

Table 3
The joint effects of classroom climate and trait emotional intelligence on Foreign Language Enjoyment.

	Regression Equations		Fit Index			Coefficient			95% CI for B	Collinearity Statistics	
	Predictor	Outcome	R	R^2	F	β	B	t		Tolerance	VIF
Sec.	CE1	FLE1	.571	.326	414.910***	.521	.117	24.081***	[.107, .126]	.840	1.191
$N1 = 1718$	TEI1					.105	.041	4.844***	[.024, .057]		
Uni.	CE2	FLE2	.684	.468	569.302***	.609	.504	25.846***	[.466, .543]	.740	1.351
$N2 = 1295$	TEI2					.129	.068	5.491***	[.044, .092]		

Note: B are Unstandardized Coefficients, β are standardized Coefficients.

Table 4
The joint effects of classroom climate and trait emotional intelligence on foreign language anxiety.

	Regression Equations		Fit Index			Coefficient			95% CI for *B*	Collinearity Statistics	
	Predictor	Outcome	*R*	R^2	*F*	*β*	*B*	*T*		Tolerance	VIF
Sec.	CE1	FLA1	.454	.206	222.390***	-.255	-.163	−10.872***	[-.193, −.134]	.840	1.191
$N_1 = 1718$	TEI1					-. 287	-.319	−12.206***	[-.370, −.267]		
Uni.	CE2	FLA2	.441	.194	155.648***	-.024	-.605	.825	[-. 220, .090]	.740	1.351
$N_2 = 1295$	TEI2					-.428	-.737	−14.743***	[-.835, -. 639]		

Note: *B* are Unstandardized Coefficients, *β* are standardized Coefficients.

even when they are learning alone because their learning goals, contents, processes and outcomes are either socially constructed or contextualized. This is especially true in contemporary foreign language learning settings, which are characterized as inherently interpersonal and communicative (Gkonou & Mercer, 2017).

The present study showed strong links between TEI and FLE and FLA at different age groups. Dovetailing with the findings in previous studies (e.g., Dewaele et al., 2008; Li, 2020a, 2020b), in both samples, participants who were more emotionally intelligent reported experiencing a higher level of enjoyment and a lower level of anxiety in their English learning. Theoretically, TEI is by definition an emotion-related individual disposition (Petrides & Furnham, 2001), which captures the ID in how people perceive and process emotion-related information and how they feel. L2 learning is imbued with transient and fleeting emotions, and TEI makes a difference for L2 learners as a relatively stable emotional competence. Students with a higher TEI may be better equipped with the ability to regulate or counter negative emotions including anxiety, and to boost and utilize positive emotions as learning resources to optimize learning effects (Li, 2020a, 2020b).

6.2. The joint effects of classroom climate and trait emotional intelligence on FLE and FLA among secondary and tertiary students

The second RQ concerned the combined effects of CE and TEI. For both age groups, CE and TEI were found to converge and have significant joint effects on FLE and FLA, indicating that both emotions arose interdependently on both the ID factor of TEI and the situational factor of CE. However, different combined patterns were found for FLE and FLA. In terms of FLE, at both age groups, after entering the same regression model, the effect of CE remained at a large size and was much larger than that of TEI. This indicates that FLE may be more subject to environmental factors than individual TEI, akin to Jiang and Dewaele's (2019) findings that FLE was more related to teacher and peer factors, and less to self-factors. This also suggests that it is more of being socially constructed and more closely linked to contextual variables (e.g., teacher and peer characteristics) than to individual variables (e.g., TEI).

In terms of FLA, the effects of CE and TEI both diminished after entering the same regression model. Comparing the two age groups, we could infer that, as learners grew older, they became less and less vulnerable to CE in terms of the experience of FLA. In addition, TEI had a consistent larger effect on FLA than CE did, suggesting that FLA was more predicted by TEI than by CE. This finding exemplified and extended Jiang and Dewaele's (2019) findings that FLA was more related to self-factors (e.g., exam and test) and less to teacher and peer variables which are the primary elements of the classroom environment. TEI in the present study was a significant addition of trait personality to Jiang and Dewaele's (2019) category of self-factors.

We found the combined effects of CE and TEI in shaping L2 emotions and their effect pattern: FLE was more related to CE, and less to TEI; while FLA was more related to TEI, and less to CE. The differences may be partially attributed to the conceptual differences of the two emotions. FLE is a multidimensional construct comprised of self-enjoyment, teacher-enjoyment and peer-enjoyment (Jiang & Dewaele, 2019), arising from ongoing learning activities (Pekrun, Frenzel, Goetz, & Perry, 2007). In contrast, FLA is generally conceptualized as being closely tied to individual performance or achievement in past or future learning activities or tasks. This indicates FLE is more of a social emotion and more related to others, while FLA is more self-performance-oriented and more related to self-factors.

In summary, our parallel investigations of the independent and joint effects of TEI and CE on FLE and FLA showcase the interdependence between CE, the individuals situated in the CE, and the experience of L2 emotions. Indeed, as Joe et al. (2017) claimed, L2 learning process (herein L2 emotions) came about in a personal negotiation with the environment. That is, L2 emotions are co-constituted or co-shaped adaptively and relationally by individual factors and situational factors, rearticulating and necessitating the person-environment perspective in emotion understanding and research.

6.3. Implications

The findings of this study on the links between L2 emotions and their person-environment antecedents in Chinese high schools and universities have revealed several enlightening implications for L2 classroom practitioners and researchers.

6.3.1. Pedagogical implications

Two important pedagogical implications are evident from this study. First, improving CE has the potential to foster students' classroom emotions. Although students' L2 emotional development can be attributed to some extent to IDs, the

findings in the present study as well as in previous ones (e.g., Dewaele et al., 2018; Khajavy et al., 2018) show clearly that students' classroom emotions could be attributed at least in part to their perceptions of classroom ecology. This points to the need for L2 teachers to recognize their fundamental role in creating a positive and comfortable CE for their students. Not surprisingly, caring, supportive, encouraging, thoughtful, respectful, attentive and emotionally available teachers are more likely to establish a positive psychosocial CE for students (Jennings & Greenberg, 2009). The establishment of a high classroom emotional climate is fundamental to not only students' emotional experiences (e.g., more FLE and less FLA in this study) and well-being, but also their academic performance (Dorman & Fraser, 2009; Jennings & Greenberg, 2009; Joe et al., 2017).

The second pedagogical implication relates to the training of teacher and student TEI. TEI captures the key ID in emotion experiences as shown in previous studies as well as in the current one. Considering its malleability and multiple effective training models (e.g., the "ARGUER" model proposed by Li & Xu, 2019), TEI training could be incorporated into L2 curriculum for its significant antecedent role in well-being as well as in academic performance. L2 exploration is never free of difficulty or obstacles. Instead, it is like a rollercoaster where people experience diverse emotions in response to the highs and downs (Gkonou, Dewaele, & King, 2020). Students with a higher TEI are fundamentally equipped better with the ability to cope with transient emotional complexities (Li, 2020c). In addition, in pre-service teacher training, TEI could also be a target dimension. As proposed, socially and emotionally competent teachers can establish strong and supportive relationships with their students as well as parents (especially at secondary education level), and colleagues (Gkonou & Mercer, 2017; Jennings & Greenberg, 2009), creating an efficient and healthy learning environment for students at different levels. Indeed, "if classroom emotions were music, teachers would be conductors and learners would be members of the orchestra" (Dewaele, 2020). In other words, teachers are the key to setting the emotional tone for the class.

Collectively, our findings point to the significance of combining positive education with L2 education from a Positive Psychology perspective (Mercer, MacIntyre, Gregersen, & Talbot, 2018; Li, 2020b): addressing not only the need for nurturing ID factors (e.g., personality traits like TEI), but also environmental factors (e.g., CE); being committed not only to improving L2 learning/teaching outcomes but also student/teacher well-being.

6.3.2. Research implication

Our investigation is an important addition to the emerging wave of investigating the joint effects of learner-internal and learner-external factors (person-environment interaction) in shaping L2 emotions (e.g., Dewaele et al., 2018; Khajavy et al., 2018). By extension, for other L2 emotions (besides FLE and FLA) or psychological processes and behaviors, an integrative framework encompassing person-environment attributes as co-predictors or co-antecedents is required in future research. Similarly, proposed the person-in-context view, highlighting the interdependence between the individual, the world which the individual is situated within, and language motivation & identity. That is, L2 experiences require a more sophisticated understanding in terms of how they are co-shaped adaptively by individuals and the learning contexts that individuals are operated on and operate on (Joe et al., 2017; Khajavy et al., 2016). Future research could also investigate whether there is a reciprocal relationship between FLE, FLA and person-environment antecedents (herein CE and TEI).

7. Conclusions

The findings offer empirical evidence of the independent and joint effects of an ID factor (TEI) and an environmental factor (CE) in shaping L2 learners' emotional experiences (FLE and FLA). The findings provide useful implications for L2 practitioners, educators (pre-service and in-service), learners as well as researchers. However, it is important to acknowledge our limitations. Firstly, social desirability bias may occur in our self-report measures. To project a more positive self-imaging, participants' responses may be skewed towards the more positive pole of the Likert type scales. Secondly, although our findings were obtained in two large-scale samples of EFL learners at different educational levels, it does not necessarily mean that the findings can be generalized to the whole L2 population considering the fundamental role social and contextual factors play in emotion construction and CE perceptions (Joe et al., 2017; Li, et al., 2018). Thirdly, we collected the data from participants in different classes, and investigated CE at individual level solely. It may be also interesting to look at CE at class level, and run multilevel analysis correspondingly. Finally, the present study adopted a quantitative cross-sectional research design to investigate the effects of TEI and CE in predicting FLE and FLA among Chinese students at secondary and tertiary levels. Longitudinal and in-depth qualitative research are needed in the future to shed more insights into the causality and complexities between person-environment and emotions in L2 learning.

Author statement

The manuscript is original work, not published elsewhere or under consideration for publication elsewhere. We declare no competing financial interests. We have not had any prior discussion with a System editor or reviewers about the work described in this manuscript.

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