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Trait emotional intelligence and foreign language performance: associations with academic self-efficacy and foreign language anxiety

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Recent years have witnessed extensive research examining the influences of positive psychological factors in foreign language learning. Building on these endeavors, the current study was specifically designed to examine how positive psychological factors including trait emotional intelligence (TEI), academic self-efficacy, and foreign language anxiety (FLA) exert influences on foreign language performance in college students who are learning a foreign language. To this end, 203 Chinese college students (141 women), recruited through snowball sampling, completed three validated questionnaires to measure their TEI (Trait Emotional Intelligence Questionnaire - Short Form), academic self-efficacy (the Chinese version of the Academic Self-Efficacy Questionnaire), and FLA levels (the Chinese version of Foreign Language Classroom Anxiety Scale). Additionally, an in-house self-rating questionnaire assessed their self-perceived foreign language performance. Mediation analysis was used to determine whether and how academic self-efficacy and FLA levels contribute separately and interactively to the relationship between TEI and foreign language performance. The results showed that: (a) there were moderate to strong associations between TEI, academic self-efficacy, FLA levels, and self-perceived foreign language performance; and (b) academic self-efficacy and FLA levels played separate and sequential mediating roles between TEI and self-perceived foreign language performance. Together, these findings highlight how TEI, academic self-efficacy, and FLA levels contribute to foreign language performance in college students. They also suggest the potential application of these positive psychological factors in mitigating anxiety elicited by learning a foreign language and improving language performance.

KEYWORDS

foreign language anxiety, academic self-efficacy, trait emotional intelligence, foreign language performance, college students

1 Introduction

Even in similar learning environments, learners' language skills, psychological states, motivation, and other related factors can significantly impact foreign language learning outcomes (Dornyei and Ryan, 2015). Most foreign language learning research focuses on negative emotions (Yu, 2021), particularly foreign language anxiety (FLA; Onwuegbuzie et al.,

1999; Horwitz, 2001, 2010; Luo, 2013; Teimouri et al., 2019). In recent years, positive psychological factors, including emotional intelligence and self-efficacy, have garnered attention when examining the factors influencing foreign language learning (Dewaele and Alfawzan, 2018; Dewaele et al., 2019; Li, 2020; Jin and Zhang, 2021; Hayasaki and Ryan, 2022). The present study aimed to explore the associations between trait emotional intelligence (TEI) and foreign language performance, and how this association is formed through the influences of academic self-efficacy and FLA.

Emotional intelligence refers to a person's ability to observe, categorize, and differentiate their own and others' feelings and emotions, as well as how this ability might influence their decisions and behaviors (Salovey and Mayer, 1990; Mayer et al., 2008). There are two different constructs of emotional intelligence: ability emotional intelligence and trait emotional intelligence (Petrides and Furnham, 2001; Petrides, 2011). TEI involves people's perceptions of the emotional world and their emotional capabilities. TEI emphasizes stable behavioral tendencies and self-perceived abilities and thus can be properly measured by self-report questionnaires (Perera, 2016). It can also be characterized as "a trait of emotional efficacy" and defined as "a constellation of emotional-related self-perceptions and dispositions located at the lower levels of personality hierarchies" (Petrides et al., 2007, p. 26). It has been found that TEI has modest to moderate effects on learners' academic performance (Perera and DiGiacomo, 2013). TEI is thought to facilitate learners' academic performance through three pathways: cognition, motivation, and interpersonal relationships (Perera, 2016), which suggests that TEI may be a critical variable that indirectly affect students' academic performance. More studies tend to use TEI as a construct in behavioral, health, organizational, and educational sciences. In the field of foreign language learning, early studies have shown that individuals with higher TEI tend to show better emotional management abilities, making them more confident in learning a foreign language (e.g., Shao et al., 2013). A meta-analytic review suggested that people with higher TEI scores report higher subjective and objective foreign language proficiency (Perera and DiGiacomo, 2013).

Self-efficacy refers to a person's belief in their capacity to plan and perform tasks to achieve desired outcomes (Bandura, 1997). Social cognitive theory suggests that self-efficacy is an agentic motivational orientation that motivates people to persevere in the presence of difficulties, set higher and long-term goals, and promote self-regulation (Bandura, 1997). Self-efficacy affects various aspects of human functioning, including performance, where high self-efficacy often correlates with better performance across a range of tasks and domains (e.g., Schunk, 1995; Stajkovic and Luthans, 1998). It has been shown that self-efficacy correlates with academic performance (Bandura, 1993; Lane and Lane, 2001; Lane et al., 2004; Komarraju and Nadler, 2013; Karbakhsh and Ahmadi Safa, 2020). Bandura (1997) previously suggested that self-efficacy is associated with TEI because higher emotional intelligence improves the controllability of emotions and self-awareness, which further leads to heightened self-efficacy. Therefore, the positive relationship between TEI and academic achievement (Perera and DiGiacomo, 2013) may be associated with self-efficacy (Perera, 2016). In school settings, academic self-efficacy primarily concerns learners' beliefs in their ability to complete specific academic tasks and achieve educational goals (Bandura, 1993). Honicke and Broadbent (2016) systematically summarized 59 studies and found that academic self-efficacy moderately correlated with academic performance. Academic self-efficacy can influence an individual's persistence, self-regulation, task selection, effort level, information processing strategies, and so forth (Bong and Skaalvik, 2003; Graham, 2022). It suggests that the impact of academic self-efficacy on academic performance is more likely to be indirect rather than direct (Graham, 2022). Honicke and Broadbent (2016) identified several factors that mediate or moderate the relationship between academic self-efficacy and academic performance. The control-value theory points out a potential pathway that the assessment of control over academic activities and outcomes as well as the value placed on these activities, are the main sources of academic emotions (Pekrun, 2006). This suggests an intrinsic connection between self-efficacy and academic emotions. A longitudinal study with college students showed that higher levels of academic self-efficacy could lead to lower levels of test anxiety emotion in future learning (Roick and Ringeisen, 2017), demonstrating a causal relationship between them.

Academic emotion refers to emotions directly experienced during learning (Pekrun et al., 2002). Negative academic emotions, including anxiety and fear, can impair foreign language learners' performance by restricting their participation and enthusiasm (Shao et al., 2013). Foreign language learners frequently experience anxiety. A study found that approximately one-third of Chinese college students felt anxious in English class (Liu and Jackson, 2008). Horwitz et al. (1986, p. 128) defined FLA as "a distinct complex of self-perception, beliefs, feelings, and behaviors related to classroom language learning arising from the uniqueness of the language learning process." Shao et al. (2013) defined FLA as the tension and worry felt in foreign language learning situations, especially in speaking and listening activities. Various factors contributing to FLA have been revealed, such as learning environment (Han et al., 2022; Gu et al., under review), language characteristics (Zhang, 2019), and individual factors (Teimouri et al., 2019). Among these factors, personality traits, including emotional intelligence, are important aspects that affect FLA (Shao et al., 2013). Learners of a foreign language frequently experience language anxiety. The existing research has mostly focused on FLA and performance (Al-Shboul et al., 2013; Teimouri et al., 2019). For example, Teimouri et al. (2019) found a negative correlation between FLA and foreign language performance. However, fewer studies have examined whether and how positive psychological factors and abilities affect this relationship and help improve the student's foreign language performance.

Previous studies including those using longitudinal design and meta-analysis have found a negative relationship between academic anxiety and performance (e.g., Awan et al., 2010; Teimouri et al., 2019; Zhang, 2019) and as well as potential mediating roles of academic emotions between TEI and language performance (e.g., Shao et al., 2013; Perera, 2016; Han et al., 2022). Furthermore, academic self-efficacy as an important component of self-concept, which is closely related to TEI, has been found to be negatively correlated with both anxiety and academic performance (Wang et al., 2021). Although there is increasing evidence for the relationships between two of these variables, we still know little about the complex associations among the three aspects, TEI, academic self-efficacy, and FLA, and also their standalone or combined contributions to foreign language performance. A more specific question to be addressed is about the

possible roles TEI and academic self-efficacy in the relationship between FLA and foreign language performance.

In this study, based on previous theoretical and empirical endeavors, we aimed to shed light on these questions by examining the relationships between TEI, academic self-efficacy, FLA, and foreign language performance. A group of native Chinese college students who speak English as a second language participated in the study and were administered questionnaires to measure these four aspects. Based on the literature above, we hypothesized that TEI would influence foreign language performance through three possible pathways: academic self-efficacy alone, FLA alone, and the combination of academic self-efficacy and FLA. Mediation analysis was used to test these hypotheses. The findings of this study could help researchers and educators gain a better understanding of foreign language learning, particularly how negative emotions and positive protective factors influence students' foreign language performance in educational setting. Educators and school administrators could find these findings useful in helping organize or refine language learning courses or programs.

2 Materials and methods

2.1 Participants

Participants were 203 university students (141 women) recruited from mainland China by snowball sampling in September and October 2022. Specifically, we used Wenjuanxing[1] to organize our survey and then disseminated the generated QR code to students for filling out who were then asked to disseminate their classmates. Of the participants, 15.76% ($N=32$) were freshmen, 16.26% ($N=33$) sophomores, 17.73% ($N=36$) juniors, 45.81% ($N=93$) seniors, 4.43% ($N=9$) year 5 students. This study was reviewed and approved by the Human Research Ethics Committee at BNU-HKBU United International College. All the participants were recruited online and completed several questionnaires (see below). Before participating in the study, each participant read and signed an informed consent form.

2.2 Instruments

We used the Chinese version of the Trait Emotional Intelligence Questionnaire - Short Form (Petrides, 2009), which has shown good validity and reliability and been widely used in previous studies (e.g., Li, 2020; Resnik and Dewaele, 2020; Di Fabio and Saklofske, 2021), to estimate participants' TEI. The questionnaire consists of 30 items with 15 items being reverse scoring questions. The questionnaire uses a 7-point Likert scale with 1 indicating strongly disagree and 7 indicating strongly agree. The higher the total score, the higher the TEI. The Cronbach's alpha was 0.91 in the current study.

We used the Chinese version of the Academic Self-Efficacy Questionnaire (Pintrich and DeGroot, 1990; Liang, 2004) to assess participants' academic self-efficacy. The Chinese version has been widely used and conceptually validated in China (e.g., Xu et al., 2015; Liu and Huang, 2023; Meng and Zhang, 2023). This 22-item questionnaire estimates two dimensions of academic self-efficacy, self-efficacy for learning ability and self-efficacy for learning behavior. This questionnaire uses a 5-point Likert format with 1 representing extremely disagree and 5 representing extremely agree. Four items were reversed items and corrected when scoring. The higher the total score, the greater the academic self-efficacy. The Cronbach's α was 0.90 in the present study.

The Foreign Language Classroom Anxiety Scale (Horwitz et al., 1986) is a widely used tool for estimating FLA levels. In the current study, we used a Chinese version of the scale (Wang, 2003) that has been widely used in studies of FLA [e.g., Gu et al. (under review)]. This 33-item Chinese version uses a 5-point Likert scale with 1 representing strongly disagree and 5 representing strongly agree. Four facets of FLA can be estimated; general worries about learning a foreign language, nervousness, communication anxiety, and fear of classroom questions. The higher the total score, the higher the FLA levels. We only used the overall score in the analysis (see below). The scale's internal consistency (Cronbach's α) was 0.97 in the current study.

In China, some college students take standardized International English Language Testing System (IELTS) or Test of English as a Foreign Language (TOEFL), while others take College English Test (CET). It is difficult to set a unified standard for measuring foreign language performance, thus we used an in-house self-rating questionnaire to measure foreign language performance. Participants were asked to rate their self-perceived overall foreign language ability and four facets (i.e., listening, speaking, reading, and writing) by indicating a number in an 11-point Likert format scale where 0 represents the lowest foreign language performance, while 10 represents the highest foreign language capacity.

2.3 Data analyses

Statistical analyses were performed using IBM SPSS 26.0. We first used the normality test and descriptive statistic to display the profile of students' TEI, academic self-efficacy, FLA, and their foreign language ability. Pearson correlation to determine the relationships between the key variables. Then, the Process Macro (Hayes, 2013) implemented in SPSS was used to conduct mediation analysis for determining the mediating effects of academic self-efficacy, FLA, and their combinations in the associations between TEI and foreign language performance. A bootstrapping procedure (5,000 times) was used to determine 95% confidence intervals of these indirect effects. Effect sizes of these indirect effects were also reported.

3 Result

3.1 Descriptive statistics and correlations

Table 1 displays the mean, standard deviation, range, skewness, and kurtosis of each variable. The skewness and kurtosis values suggest that the distributions of these variables are approximately normal. Table 1 also presents the correlations between these key variables. All the correlation coefficients were statistically significant. Specifically, TEI was positively correlated with self-rated foreign language performance ($r=0.401$, $p<0.001$). Academic self-efficacy

1 https://www.wjx.cn/

TABLE 1 Descriptive statistics and inter-correlations among all the variables.

Variables	M (±SD)	Range	95%CI	Skewness	Kurtosis	TEI	ASE	FLA	Self-rated FLP
TEI	140.23 (±23.584)	[60, 193]	[137, 143.34]	−0.085	−0.034	–			
ASE	75.18 (±12,902)	[41, 106]	[73.42, 76.91]	−0.367	0.046	0.663*** [0.566, 0.745]	–		
FLA	93.83 (±28.524)	[34, 163]	[90.02, 97.74]	0.001	−0.642	−0.483*** [−0.584, −0.372]	−0.472*** [−0.588, −0.338]	-	
Self-rated FLP	7.00 (±1.893)	[1, 11]	[6.73, 7.25]	−0.880	1.239	0.401*** [0.278, 0.514]	0.537*** [0.417, 0.638]	−0.598*** [−0.695, −0.483]	-

TEI, trait emotional intelligence; ASE, academic self-efficacy; FLA, foreign language anxiety; Self-rated FLP, self-rated foreign language performance. 95% confidence intervals were calculated based on 5,000 bootstrap replicates. ***$p < 0.001$.

was positively correlated with TEI ($r = 0.663$, $p < 0.001$) and self-rated foreign language performance ($r = 0.537$, $p < 0.001$), but negatively correlated with FLA ($r = -0.472$, $p < 0.001$). Significant negative correlations were found between FLA and TEI ($r = -0.483$, $p < 0.001$) and between FLA and self-rated foreign language performance ($r = -0.598$, $p < 0.001$).

3.2 Mediation analysis

Following correlation analyses, we conducted mediation analyses with a model including academic self-efficacy and FLA as mediators, TEI as the independent variable, and foreign language performance as the dependent variable (Figure 1). The results showed that the total effect of the model was statistically significant ($\beta = 0.0322$, $p < 0.001$, 95% CI = [0.0220, 0.0424]), the total indirect effects was statistically significant ($\beta = 0.4601$, $p < 0.001$, 95% CI = [0.3375, 0.5900]; Table 2). More specifically, the indirect effects of academic self-efficacy alone accounted for 52.08% of the total indirect effects (95% CI = [0.1372, 0.3595]), and FLA alone accounted for 30.15% of the total indirect effects (95% CI = [0.0606, 0.2296]).

These results suggested that both the two mediators could independently play mediating roles in the relationships between TEI and foreign language performance. Furthermore, academic self-efficacy and FLA play complete sequential mediating roles in the mediation model ($\beta = 0.817$, 95% CI = [0.025, 0.1432]), 17.76% of the overall indirect effect, and the direct effects of TEI were not significant ($\beta = -0.0047$, $p > 0.05$, 95% CI = [−0.4193, −0.0163]).

4 Discussion

In the current study, we explored the relationships between TEI and foreign language performance by examining the multiple mediating roles of academic self-efficacy and FLA. We found that academic self-efficacy and FLA not only independently mediated the association between TEI and foreign language performance, but also together played a serial mediating role in the association. These findings contributed to a better understanding of how TEI and other influencing factors interactively affect student's foreign language performance.

Our results showed that TEI had positive associations with academic self-efficacy and foreign language performance and a negative correlation with FLA levels. Students with higher TEI are more likely to manage their study process and emotions (Bandura, 1997), which benefits their foreign language learning. Moreover, they have more confidence and optimism in assessing their foreign language achievement. In addition, we also found a negative relationship between academic self-efficacy and FLA levels. These findings are consistent with previous findings (e.g., Chen and Lin, 2009; Roick and Ringeisen, 2017; Udayar et al., 2020). These findings also can be better understood through the control-value theory. According to the theory, subjective control that could be operationalized as self-efficacy is one of the major sources of academic emotions (Pekrun, 2006). Students with high self-efficacy are better able to manage their emotions while learning a foreign language, resulting in lower levels of anxiety. Previous studies also provided evidence of the association between FLA levels and foreign language achievement from different age groups of students that a high level of anxiety would impair learner's performance (e.g., Al-Shboul et al., 2013; Teimouri et al., 2019).

The mediation results showed that TEI could influence students' foreign language achievement via students' academic self-efficacy. The finding is in line with previous studies (Udayar et al., 2020; Chang and Tsai, 2022) showing that self-efficacy mediates TEI and academic performance, as well as foreign language achievement, in different college student populations in different countries. Students with higher emotional intelligence tend to have higher self-efficacy. A stronger sense of academic self-efficacy may lead learners to set higher goals for themselves and pursue their commitment, which in turn could lead them to higher foreign language achievement (Bandura, 1997). Furthermore, FLA also plays a mediating role between TEI and foreign language performance. It is likely that students with higher emotional intelligence possess higher emotional management skills, reducing academic anxiety and thereby enhancing their foreign language performance (Bastian

et al., 2005; Greven et al., 2008; Pena-Sarrionandia et al., 2015). Another potential explanation for this pathway may be that people with higher TEI are more adept at changing their thinking patterns to prevent negative emotions (Schutte et al., 2009), which could help them reduce their FLA levels and get back into learning faster, and significantly improve their foreign language learning performance (Perera, 2016).

More interestingly, we found that the relationship between TEI and foreign language performance was sequentially mediated by academic self-efficacy and FLA. According to Bandura (1997), self-efficacy may be affected by the ability to regulate emotions, which is conceptually associated with TEI. Moreover, people's causal reasoning processes, which are significantly influenced by TEI, could also affect an individual's academic self-efficacy (Gundlach et al., 2003). For example, a causal reasoning process could affect people's attributions, which in turn affect their self-efficacy levels (Gundlach et al., 2003). Specifically regarding academic anxiety, academic self-efficacy is considered to play a significant role in the affective sensation, wherein low self-efficacy beliefs increase anxiety and reduce achievement (Bandura, 1997). Students' TEI can have a positive influence on their academic self-efficacy by enhancing their self-awareness (Bandura, 1997). Students with lower self-efficacy have more negative expectations about their learning and a sense of control over their learning, leading them to experience more anxiety in the learning processes (Bandura, 1997). In addition, TEI could enhance learners' adaptive coping ability and emotional regulation (Pena-Sarrionandia et al., 2015), which help them face academic stress and achieve academic goals (Arsenio and Loria, 2014). Taken together, students with higher emotional intelligence have better academic self-efficacy, which helps them better control their emotions and reduce their FLA levels, ultimately enhancing their foreign language abilities.

However, the direct effect of TEI on foreign language performance was not significant. This result can be well explained by previous findings that TEI does not directly associate with academic performance (Rode et al., 2007; Perera and DiGiacomo, 2015). The effect sizes of the indirect effects in the mediation analysis suggest a possible explanation for the negligible direct effect of TEI on foreign language performance. That is the effects of academic self-efficacy and FLA are large enough to adequately mediate the effect of TEI on foreign language performance (Udayar et al., 2020). More specifically, the effect of academic self-efficacy on the relationships between TEI and foreign language performance accounts for more than half of the total effect. Self-efficacy and motivation are closely intertwined concepts (Pajares, 1996). Schunk (1991) illustrated how self-efficacy beliefs influence students' motivation and learning outcomes in academic contexts. Zimmerman (2000) even considered self-efficacy as a crucial motivational factor in the learning process, emphasizing its impact on students' engagement and performance. Therefore, this may explain why self-efficacy mediated more than half of the total effect of TEI. In the current study, students should not only have TEI but also should know how to and be motivated to use their TEI in their foreign language learning. In addition, previous studies also showed heterogeneous results that TEI does not show predictive and correlational relationships with academic achievement across all studies or all subjects (e.g., Ferrando et al., 2011; Chang and Tsai, 2022; Chen and Zhang, 2022). The heterogeneity may indicate that other moderators, such as gender, age, and special learning requirements or situations, may influence the relationship (Zahed-Babelan and Moenikia, 2010; Perera and DiGiacomo, 2013).

Three limitations should be considered for future studies. First, the current data were collected in September and October, coinciding with the start of a new semester. This period, characterized by relatively fewer assignments requiring foreign language use, may have resulted in lower FLA levels among students compared with other periods (e.g., mid-term or end of the semester), which typically involve more foreign language assignments or tasks (e.g., essays or closed-book exams), potentially leading to higher FLA levels (Kruk, 2018). Future studies could compare FLA levels at different time points during the semester and their associations with TEI, academic self-efficacy, and foreign language performance. These endeavors could help us better understand the influence of different time points on foreign language learning and other related questions. Second, the foreign language performance we assessed was based on self-ratings. There are a few common different standard tests and assessments (e.g., IELTS and TOEFL) for measuring college students' foreign language ability, it is therefore hard to establish a unified standard for determining the foreign language performance of students who have taken different tests and assessments. Therefore, the way we measured foreign language performance should be carefully considered when generalizing the current findings. Future studies are needed to examine

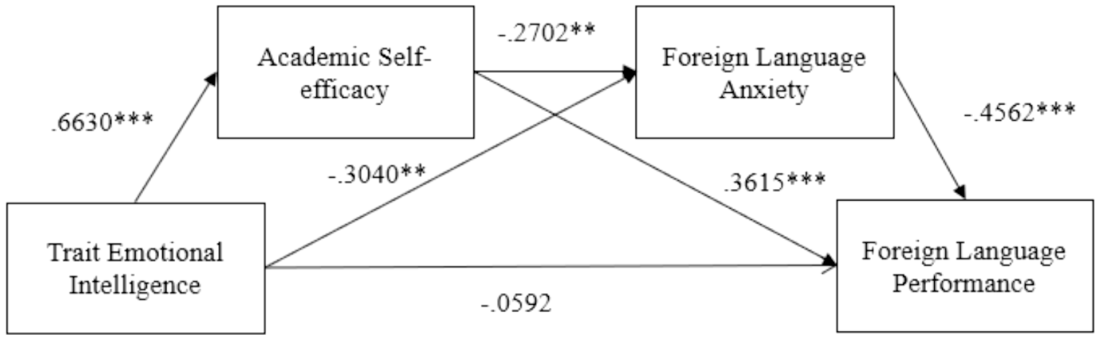

FIGURE 1
The mediation model in the present study. **$p < 0.01$, ***$p < 0.001$.

TABLE 2 Effects in the mediation model.

Effects	Estimate	95% CI	Effect size
Total	0.4601	[0.3375, 0.59]	100.00%
TEI - > ASE - > self-rated FLP	0.2396	[0.1372, 0.3595]	52.08%
TEI - > FLA- > self-rated FLP	0.1387	[0.0606, 0.2296]	30.15%
TEI - > ASE- > FLA- > self-rated FLP	0.0817	[0.025, 0.1432]	17.76%

TEI, trait emotional intelligence; ASE, academic self-efficacy; FLA, foreign language anxiety; Self-rated FLP, self-rated foreign language performance.

whether and how the associations between foreign language performance, FLA, TEI, and academic self-efficacy are modulated by different measurement tools. Third, the data in the current study are cross-sectional. It is encouraged to use a longitudinal design to build causal relationships (Jose, 2016). A longitudinal mediation analysis could provide stronger evidence for the indirect effects observed in the current study (Jose, 2016). Future studies are therefore needed to extend our findings.

Despite these limitations, our research findings have practical implications for educators, foreign language teachers, and school administrators. First, we emphasize the positive, protective influences of TEI in foreign language education. In schools, educators and school administrators could develop emotional intelligence courses or programs to enhance students' emotional intelligence, helping to reduce the anxiety associated with foreign language learning. Second, foreign language teachers should pay attention to cultivating and developing academic self-efficacy among students. Since our mediation analysis revealed that students' TEI could affect their foreign language performance through academic self-efficacy and FLA, it is highly recommended that educators and school administrators integrate emotional intelligence and academic self-efficacy into their foreign language learning courses or programs. In addition, our research findings also encourage researchers to explore the complex relationship between TEI and foreign language learning by taking into account other important variables that may have negative or positive influences on this relationship.

5 Conclusion

In this study, we explored the relationships between TEI and foreign language performance by examining the multiple mediating roles of academic self-efficacy and FLA. The results suggest that academic self-efficacy and FLA not only independently mediate the association between TEI and foreign language performance, but also together play a serial mediating role in the association. The current study provides new insights into foreign language learning and its influencing factors among Chinese college students and also highlights how positive psychological factors can be used to enhance language proficiency and reduce the anxiety associated with learning a foreign language in school settings.

Data availability statement

The datasets presented in this study can be found in online repositories. The names of the repository/repositories and accession number(s) can be found at: https://osf.io/3xgwn/.

Ethics statement

The current study was approved by the Human Research Ethics Committee at BNU-HKBU United International College. The current study was conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

FJ: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Software, Validation, Visualization, Writing – original draft, Writing – review & editing. CG: Conceptualization, Data curation, Investigation, Methodology, Visualization, Writing – original draft. YL: Conceptualization, Data curation, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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