



Positive emotions, self-regulatory capacity, and EFL performance in the Chinese senior high school context

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ABSTRACT

Previous research on English as a foreign language (EFL) learning has predominantly focused on negative emotions such as anxiety and boredom, neglecting positive emotions. Self-regulation, a cognitive factor, has emerged as a key construct of positive psychology in recent years. However, few studies have examined the mechanisms by which positive emotions influence EFL performance, especially through cognitive factors. Given the high-stakes nature of Chinese college entrance examination and Chinese culture's value on effort, Chinese senior high school students may experience distinct EFL emotions. Therefore, this study, based on the control-value theory (CVT), explored the potential mediating role of self-regulatory capacity (boredom, awareness, goal, and emotion controls) in the relationship between the three focal positive emotions (enjoyment, hope, and pride) and EFL performance among Chinese senior high school students. A paper-and-pencil questionnaire survey was administered to 330 Chinese third-year senior high school students (male: $n = 159$; female: $n = 171$). The data were analyzed using descriptive statistics, correlation analysis, and mediation analysis with SPSS 26 and PROCESS V3.3. The results indicated that the students reported low levels of enjoyment and pride, moderate levels of hope, low levels of awareness, goal, and emotion controls, and moderate levels of boredom control. The results also revealed significant and large associations among the three positive emotions, the four components of self-regulatory capacity, and EFL performance. Furthermore, the results suggested that self-regulatory capacity partially mediated the effect of positive emotions on EFL performance, supporting the CVT framework. The study concluded with implications for educators and suggestions for future research.

1. Introduction

The influence of emotions on English as a foreign language (EFL) learning has attracted considerable attention from researchers and educators, as emotions are not only subjective feelings, but also powerful motivators and regulators of human behavior and cognition (Fredrickson, 2001). In the 21st century, a prominent approach that focuses on the strengths and well-being of individuals is positive psychology, which is grounded on the pillars of positive institutions, characteristics, and emotions (Wang et al., 2021; Wang & Guan, 2020). Among the various emotions that EFL learners may experience, positive emotions have been particularly highlighted by this approach, as they can enhance learners' self-regulation, a key construct that has been recognized for its close links with emotion, behavior, and long-term academic achievement. Self-regulation is a kind of positive characteristic that

enables learners to monitor and control their own learning processes and outcomes (Zimmerman, 2011). In the field of EFL learning, previous studies have revealed that self-regulation is associated with learners' emotions and performance (Adigüzel & Orhan, 2017; Chen et al., 2022; Huang, 2022; Teng, Qin, et al., 2022; Yin, 2021). Therefore, this study aims to explore the roles of two key constructs in positive psychology: positive emotions and self-regulation, in facilitating EFL outcomes and experiences. Specifically, this study focuses on three positive emotions: enjoyment, hope, and pride, which have been shown to have different effects on EFL learning (Dewaele & Alfawzan, 2018; Li, 2020; Li et al., 2020; Yu et al., 2022).

Previous studies in the field of EFL learning have applied the principles of positive psychology to examine how positive emotions, particularly enjoyment, and self-regulated learning can facilitate EFL learning (Dewaele & Alfawzan, 2018; Li, 2020; Teng & Zhang, 2020).

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While prior research has provided valuable insights, certain critical aspects remain underexplored or underrepresented. First, the majority of them has mainly focused on enjoyment, while neglecting two other key emotions: hope and pride. These emotions are essential for EFL learning, as they are related to plan setting, goal attainment, and self-efficacy (Snyder, 2002; Sullivan, 2014). The lack of research on hope and pride may be attributed to the gradual development of a research field. For instance, anxiety has been the dominant topic in EFL emotions research for a long time, and only recently another significant negative emotion, boredom, has attracted researchers' attention (Li, 2021a, 2021b; Wang, 2023). A similar situation may occur in the investigation of hope and pride. Second, most of them used convenience sampling and recruited college students as participants, which might compromise the external validity of their findings. The emotional experiences of senior high school students in EFL learning deserve more attention, as they undergo a critical period of forming emotional habits that affect their psychological well-being and encounter more frequent, intense, and unstable emotions. This is especially true for senior high school students in China, who face a highly competitive college entrance exam (Che et al., 2015; Liu et al., 2020; Zhang et al., 2016; Zhao, 2022). Third, few studies have explored the impact of positive emotions on self-regulated learning in the EFL context. This is a significant gap to bridge, as self-regulated learning is a key cognitive factor in the link between emotions and academic achievement (Huang, 2022; Yin, 2021). Fourth, few studies have developed and tested a comprehensive model that incorporates positive emotions, self-regulated learning, and EFL performance and examines the mechanism underlying their relationships, although the control-value theory (CVT), a theory from educational psychology, suggests that achievement emotions influence academic achievement through a series of cognitive factors, among which self-regulated learning is one (Pekrun & Perry, 2014). To address the limitations of previous literature, we aimed to conduct a thorough and detailed examination of the potential mediating role of self-regulated learning in the relationship between positive emotions and EFL performance among Chinese senior high school students from a positive psychology perspective.

2. Literature review

2.1. Control-value theory

The control-value theory (CVT) is a prominent theoretical framework for studying achievement emotions in academic settings, developed by Pekrun (2006). According to the CVT, achievement emotions are affective responses to academic activities or outcomes, such as learning, testing, or grades. These emotions are influenced by two key appraisals: control and value. Control appraisals refer to the perceived ability to influence the academic outcomes, while value appraisals refer to the perceived importance or interest of the academic tasks. The CVT also proposes that achievement emotions have various effects on academic outcomes, mediated by cognitive and motivational processes, such as attention, memory, metacognition, self-regulation, motivation, and volition. This is called the cognitive-motivational model (Pekrun & Perry, 2014).

The CVT is a comprehensive and systematic framework for studying EFL emotions, as it explains the origins, functions, and regulation of affective responses to EFL activities or outcomes (Dewaele & Li, 2022; Li & Li, 2022; Yu et al., 2022). Previous studies based on the CVT have mainly focused on the antecedents of EFL emotions, especially the role of control-value appraisals in shaping different types of EFL emotions, such as enjoyment, anxiety, boredom, hope, and pride (Li, 2021a, 2021b; Shao et al., 2020). However, less attention has been paid to the consequences of EFL emotions, particularly the cognitive-motivational mechanisms that mediate the impact of EFL emotions on EFL performance. However, less attention has been paid to the consequences of EFL emotions, particularly the cognitive-motivational mechanisms that

mediate the impact of EFL emotions on EFL performance. One of these mechanisms is self-regulated learning, which, considered as a crucial cognitive skill for EFL learners to achieve their learning goals and enhance their language proficiency, has recently gained attention from language researchers (Huang, 2022; Yin, 2021). Despite the importance of these variables, no empirical study has examined the potential mediating role of self-regulated learning in the effect of emotions on EFL performance.

In this study, we adopted the CVT as the theoretical basis for two reasons. First, it offers an effective framework for analyzing diverse EFL emotions in relation to different academic contexts and outcomes. Second, it allows us to explore the interplay between positive EFL emotions and self-regulated learning in affecting EFL performance. Based on the cognitive-motivational model of emotion effects proposed by the CVT (Pekrun & Perry, 2014), we hypothesized that positive EFL emotions would positively influence EFL performance through enhancing self-regulated learning. The proposed model is presented in Fig. 1.

2.2. Positive emotions and EFL performance

2.2.1. Historical background

Emotions are crucial factors that affect English as a foreign language (EFL) learners' outcome. The research on emotions in EFL learning, which originated in the 1970s (Chastain, 1975), has predominantly focused on negative or aversive emotions, such as anxiety and boredom (Derakhshan et al., 2021, 2022; Wang, 2023). However, in recent years, some language researchers have shifted their attention to positive emotions in EFL learning, inspired by the perspective of positive psychology. Positive psychology is a scientific field that investigates the conditions and processes that enable groups and individuals to flourish or function optimally (Gable & Haidt, 2005). According to Seligman and Csikszentmihalyi (2000), positive psychology research rests on three pillars: positive emotions (e.g., enjoyment and hope), positive characteristics (e.g., strengths and virtues), and positive institutions (e.g., family and school). By exploring the role of positive emotions in EFL learning, language researchers aim to gain a more comprehensive understanding of the diverse emotions involved in this process (Li, 2021a, 2021b; Yu et al., 2022; Zhang et al., 2021). As a key component of positive psychology, positive emotions deserve attention and may play a central role in EFL learning, which is a gradually developing process that requires long-term effort, motivation, interest, resilience, optimism, etc. Based on the CVT, enjoyment, hope, and pride are the three most prevalent positive emotions in educational settings (Pekrun & Perry, 2014).

2.2.2. Understanding enjoyment, hope, and pride

Defined as the feeling of pleasure and satisfaction that arises from engaging in or completing a learning activity or task, enjoyment is a powerful emotion that motivates learners to overcome obstacles and enhance their skills (Ainley & Hidi, 2014), and it is essential for EFL

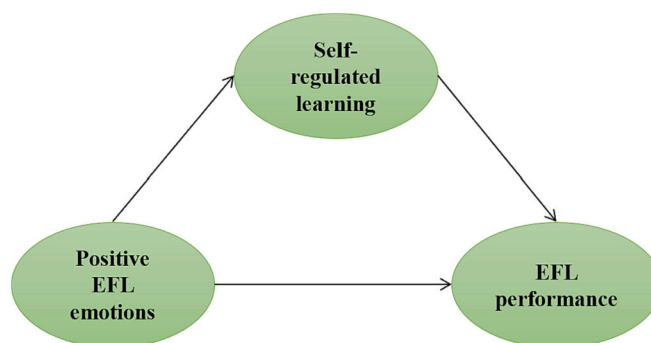


Fig. 1. Cognitive model of positive EFL emotions, self-regulated learning, and EFL performance.

teaching and learning (Dewaele & Macintyre, 2014; Li et al., 2018). According to Snyder's hope theory, hope is the combination of individuals' perceptions of their ability to use their skills to achieve desired goals, which involves the development of a plan to reach them (pathways), and the commitment to their purpose (agency) (Lopez et al., 2009; Snyder, 2002). Pride is an emotion that usually reflects individuals' positive self-evaluation of their own behavior, actions, possessions, relationships, affiliations, self, or identity (Sullivan, 2014). Pride can be experienced as a result of achieving a goal, overcoming a challenge, or demonstrating competence or excellence in a domain (Tracy & Robins, 2007). According to the definitions, hope may play a crucial role in enabling EFL learners to pursue their goals, while pride could act as a positive reinforcement for their motivation to learn EFL.

2.2.3. Studies on positive emotions' relations with EFL performance

The research on enjoyment has received increasing attention in the field of EFL learning in recent years. Numerous studies conducted in various cultural contexts have revealed enjoyment's positive associations with learners' EFL performance (Dewaele & Alfawzan, 2018; Li, 2020; Li et al., 2020; Yu et al., 2022). Hope and pride have received less attention than enjoyment in EFL emotion research, and they are often examined by language researchers in studies that explored the impact of various emotions on EFL performance. For example, Lee (2014) investigated emotions experienced by Korean and German high students in EFL learning from a cross-cultural perspective and found that positive emotions including hope and pride were positively associated with FL performance in both samples. Moreover, in the study of Shao et al. (2020) that analyzed the relationship between control-value appraisals, eight focal emotions, and EFL performance among college students, positive emotions comprising hope and pride were found to be positive predictors of EFL performance. Recently, Yu et al. (2022) also found positive correlations between hope and pride as positive emotions and EFL performance. These studies have examined the positive associations between hope, pride, and enjoyment and EFL performance, but they have not revealed the underlying mechanism through which these positive emotions influence EFL learning outcomes.

2.3. Positive emotions and self-regulated learning

2.3.1. Understanding self-regulated learning

Self-regulated learning is a dynamic and constructive process that involves learners' ability to control their own cognition, behavior, emotion, and motivation to achieve their learning goals (Zimmerman, 2002; Zimmerman, 2011). Self-regulatory capacity is a key component of self-regulated learning that measures how well learners can regulate their attention, effort, and affect in English as a foreign language (EFL) learning situations (Tseng et al., 2017). The importance of self-regulatory capacity for learning outcomes has been empirically demonstrated by Duckworth and Seligman (2005), who found that it explained more variance than other academic activities. This finding provides a strong rationale for using self-regulatory capacity as a measure of self-regulated learning in EFL contexts.

Self-regulatory capacity consists of four dimensions: emotion, goal, awareness, and boredom controls. Emotion control refers to the ability to cope with multiple emotions that arise in EFL learning. Learners with high emotion control can calm themselves down when encountering difficulties or celebrating their achievements without being overconfident. Goal control emphasizes the positive attitude and voluntary effort that learners have to reach their learning goals. Learners with high goal control can set realistic and specific goals for themselves and monitor their EFL learning progress regularly. Awareness control reflects the ability to assess and monitor the potential and actual distractions that may interfere with EFL learning from internal or external sources. Learners with high awareness control can minimize the influence of irrelevant noises or interruptions on their EFL learning. Boredom control highlights the negative emotional state that could reduce the

likelihood of employing learning strategies, especially those that require metacognition or effort such as critical thinking. Learners with low boredom control may lose interest or motivation in EFL learning when they find it too easy or too difficult.

2.3.2. Studies on self-regulated learning's relations with positive emotions

Self-regulated learning posits flexibility in adapting individuals' actions to task requirements. Therefore, the CVT presumes that positive emotions like enjoyment, hope, and pride are also expected to promote students' self-regulated learning as they are considered to improve flexible thinking and acting (Pekrun & Perry, 2014). This presumption has been corroborated by various studies in general education that have investigated the relationship between academic emotions, self-regulated learning, and academic achievement using different statistical methods. For instance, Artino and Jones (2012) and You and Kang (2014) used multiple linear regression to show that enjoyment positively predicted or correlated with self-regulated learning behaviors such as elaboration and metacognition. Mega et al. (2014) and Zheng and Li (2016) used structural equation modeling to demonstrate that self-regulated learning mediated the significant effect of academic emotions including enjoyment, hope, and pride on academic achievement.

However, these studies were not conducted in the field of EFL learning, which has its own specific characteristics and challenges. The generalizability of the findings from general education to EFL learning is questionable, as EFL learning has its own specific characteristics and challenges that may affect the interplay between positive emotions and self-regulated learning. Therefore, more research is needed to test the CVT's presumption in EFL contexts and to identify the possible ways of enhancing students' self-regulation through positive emotions. A few recent studies have noticed this research gap by theoretically discussing the relationship between positive emotions and self-regulated learning in EFL learning (Huang, 2022; Yin, 2021). These studies provide some preliminary insights for understanding and facilitating the emotional and self-regulatory aspects of EFL learning, but work is still needed to offer empirical evidence for EFL education.

2.4. Self-regulated learning and EFL performance

2.4.1. Intervention studies on self-regulated learning's relations with EFL performance

The literature on self-regulated learning and English as a foreign language (EFL) performance has predominantly investigated the relationship between self-regulated strategies and specific domains of EFL learning, such as writing, reading, vocabulary, and listening. Among these domains, writing and reading have received the most attention, while vocabulary and listening have been relatively less explored. Intervention studies, which examine the effects of strategy instruction on EFL learners' performance and attitudes, are the common research design in this field.

For writing, researchers usually adopted intervention studies, that is, they examined the effects of self-regulated strategies-based instruction on EFL writing and generally found that strategy-based instruction could enhance EFL learners' strategy use level and thus improve their writing performance (Chen et al., 2021; Nguyen & Gu, 2013; Teng, 2016; Teng & Zhang, 2020). Similarly, intervention studies were widely used to verify the role of self-regulated learning in improving EFL reading performance. Researchers commonly found that through self-regulated reading strategies-based instruction, EFL learners' reading performance was significantly improved and their attitudes toward reading were also significantly enhanced (Alreshoud & Abdelhalim Aly, 2022; Graham et al., 2020; Macaro & Erler, 2007). There were also sporadic studies that implemented strategy instruction to improve EFL learners' performance in vocabulary tests (Mizumoto & Takeuchi, 2009) and listening comprehension (Abdolrezapour & Ghanbari, 2021).

2.4.2. Cross-sectional studies on self-regulated learning's relations with EFL performance

In addition to intervention studies, some cross-sectional research also found that self-regulated learning strategies predicted EFL learners' performance in different domains. For writing, [Teng, Qin, et al. \(2022\)](#) and [Teng, Wang, et al. \(2022\)](#) found that self-regulated writing strategies were positively correlated with EFL learners' writing performance. Concerning reading, [Tse et al. \(2022\)](#) found that self-regulated reading strategies were associated with EFL learners' reading comprehension and motivation. Regarding vocabulary, [Bošnjak Terzić and Pavičić Takač \(2020\)](#) analyzed EFL learners' structured diaries focusing on vocabulary learning for a period of six months and found that successful learners were aware of and used all aspects of self-regulated strategies, while less successful students reported using fewer and less complex learning strategies.

However, most of these studies have focused on one facet of EFL learning at a time, which may limit the generalizability of their findings to other domains or to the overall EFL performance. Therefore, there is a need for more comprehensive studies that examine the relationship between self-regulated learning and EFL performance from a holistic perspective.

3. Research questions

Before presenting the proposed mediating model, it is necessary to summarize the main findings from the literature review that support the theoretical basis of this study. The literature review has revealed the following correlations: (1) Positive emotions (enjoyment, hope, and pride) are correlated with students' EFL performance; (2) these emotions are related to self-regulated learning; (3) self-regulated learning is connected to EFL performance. Moreover, the cognitive model theoretically proposed above is consistent with these empirical findings. Based on this, a mediating model is proposed, in which self-regulated learning mediates the effect of the three emotions on EFL performance.

As mentioned above, self-regulatory capacity is a more effective measure than other academic activities. Furthermore, the measure developed by [Tseng et al. \(2017\)](#) is specific to EFL learning rather than general education. Therefore, self-regulatory capacity was chosen as the indicator of students' self-regulated learning. Additionally, due to the highly competitive college entrance exam, Chinese senior high school students tend to experience more intense emotions than their peers in many other countries, which warrants more attention from researchers ([Che et al., 2015](#); [Liu et al., 2020](#); [Zhang et al., 2016](#); [Zhao, 2022](#)). Hence, Chinese senior high school students were selected as participants. However, this does not mean that the findings of this study are only applicable to this specific group of learners. On the contrary, it is expected that the proposed mediating model can be generalized to other populations of learners who may also experience positive emotions and self-regulated learning in their EFL learning.

Specifically, this study aimed to answer the following three research questions to provide implications for educational interventions targeting Chinese senior high school students in the EFL learning context:

RQ1: How do Chinese senior high school students typically score on measures of positive emotions (enjoyment, hope, and pride) and self-regulatory capacity?

RQ2: What correlations exist between positive emotions (enjoyment, hope, and pride), self-regulatory capacity, and EFL performance in Chinese senior high school students?

RQ3: In Chinese senior high school students, does self-regulatory capacity act as a mediator between positive emotions (enjoyment, hope, and pride) and EFL performance?

4. Method

4.1. Participants

Compared to other grades, Chinese students in the third (final) year of senior high school may encounter more intense emotional experiences in EFL learning due to the fierce competition of the upcoming college entrance examination. The participants of this study were 330 third-year senior high school students (male: 159, female: 171; age: 16–19; $M = 17.16$ years; $SD = 0.460$) from three urban schools in Zhejiang, China. They completed a questionnaire that included demographic information and two Likert scales. The demographic information consisted of gender, age, and school. The two Likert scales measured the students' levels of positive emotions and self-regulatory capacity in their EFL learning. They were recruited through purposeful sampling based on the following inclusion criteria: (1) they volunteered for the study; (2) they chose English as their foreign language rather than other languages; (3) they represented both genders as experienced emotions may differ across genders. For example, previous research showed that Chinese female senior school students tended to perceive more enjoyment than their male counterparts ([Huang & Jiang, 2022](#)). Among them, 213 (64.55 %) were from two regular senior high schools and 117 (35.45 %) were from a key senior high school. Before the research, participants and their custodians were required to read carefully the informed consent that detailed the purpose, procedure, and confidentiality of the study. Then, the consent from their custodians was obtained. This study was approved by the Ethics Committee of Hunan Normal University.

To ensure the validity of the self-report scales pertaining to positive emotions and self-regulatory capacity, we employed a translation and back-translation procedure. Three bilingual researchers translated the scales from English into Chinese and back-translated them into English. Then, one expert in psychology and one expert in translation further reviewed and revised the wording of the items to reach the closest semantic equivalence across the English and Chinese versions. We required participants to complete the Chinese scales, but we also provided them with the English scales so that they could check the original meaning of items whenever needed.

4.2. Measures

4.2.1. Positive emotions

The learning-related emotion subscales of the Achievement Emotions Questionnaire (AEQ) were used to measure students' positive emotions, as specific emotion subscales can be used independently ([Pekrun et al., 2011](#)). Students were asked to report how they felt about learning English on a Likert scale from 1 (strongly disagree) to 5 (strongly agree). The positive emotion subscales consisted of 22 items, assessing enjoyment (ten items; e.g., "I enjoy acquiring new knowledge"), hope (six items; e.g., "I have an optimistic view toward studying"), and pride (six items; e.g., "I'm proud of my capacity"). The sum of the scores of all items formed the positive emotion indexes (enjoyment $\alpha = 0.825$, hope $\alpha = 0.711$, pride $\alpha = 0.844$).

4.2.2. Self-regulatory capacity

The Self-Regulatory Control Scale for Language Learning (SRLang scale) ([Tseng et al., 2017](#)) was used to test students' self-regulatory capacity. The SRLang scale consists of 20 items, examining students' proactive control of strategy use or self-regulatory capacity for EFL learning. It assesses four controls: boredom control (five items; e.g., "When I feel stressed about English learning, I know how to reduce this stress"), awareness control (five items; e.g., "When I am studying English and the learning environment becomes unsuitable, I try to sort out the problem"), goal control (five items; e.g., "When learning English, I believe I can achieve my goals more quickly than expected") and emotion control (five items; e.g., "When feeling bored with learning

English, I know how to regulate my mood in order to invigorate the learning process”). Students were asked to rate each item on a 4-point Likert scale from 1 (disagree) to 4 (agree). The sum of the scores of all items formed the total score, and a higher total score indicated students' better proactive control of strategy use for EFL learning (boredom control $\alpha = 0.764$, awareness control $\alpha = 0.770$, goal control $\alpha = 0.751$, emotion control $\alpha = 0.737$).

4.2.3. EFL performance

Following Shao et al. (2020), we selected students' score on the final English exam in their first semester as the indicator of their EFL performance. The final English exam was developed and scored by the English teachers of the local educational bureau. It was designed as a practice test that simulated the National College Entrance Examination in China. The exam consisted of a variety of items, including multiple choices, a cloze-test, fill-in-the-blanks, and essay writing, which were considered to effectively reflect participants' EFL performance (range 0–150; $\alpha = 0.865$).

4.3. Data collection procedure

To capture the students' emotional states during a high-stakes period, we administered a paper-and-pencil questionnaire two weeks before the final exam of the first semester. We chose this method because mobile phones are prohibited in Chinese senior high schools. We obtained permission from the leaders of three senior high schools and distributed 120 questionnaires to each school with the help of the headteachers. The students completed the questionnaires during their self-study class and returned them immediately. To reward their voluntary participation, we offered each student a red envelope (Hong-bao: a common Chinese way of gifting money). The survey was not anonymous, as we needed to match the questionnaire data with the students' exam scores. Nevertheless, students were assured of the confidentiality of their responses. A total of 360 questionnaires were collected and 30 invalid ones were discarded, as they were incomplete or nameless. Three weeks after the survey, we collected the final English exam scores of the 330 students who participated this survey from their headteachers.

4.4. Data analysis

To answer the first research question, we checked the data for normality using SPSS 26 and performed descriptive analyses. SPSS 26 is especially suitable for these statistical analyses because powerful and user-friendly software that can provide a quick and easy way to explore and summarize the data. Following Field (2009), we considered data with standardized skewness values between 0 and ± 3.0 and standardized kurtosis below ± 8.0 as normally distributed. To examine the second research question, we calculated Pearson correlation coefficients for the data. According to Plonsky and Oswald (2014), we interpreted 0.25 as a small effect size, 0.40 as a moderate effect size, and 0.60 as a large effect size. To provide more detailed references for possible interventions targeting Chinese senior high school students' EFL learning, we tested the mediating roles of all components of self-regulatory capacity in the relationship between each positive emotion and EFL performance using PROCESS V3.3 (model 4) (Hayes et al., 2017) for the third research question. PROCESS V3.3 a macro for SPSS that can estimate complex models of mediation analysis using regression-based methods.

5. Results

5.1. Students' positive emotions and self-regulatory capacity

The first research question explored the typical levels of positive emotions (enjoyment, hope, and pride) and self-regulatory capacity (boredom, awareness, goal, and emotion controls) among students in the

EFL (English as a foreign language) learning context. To address this question, descriptive statistics were calculated for each variable, including the mean, range, standard deviation, median, and mode. The results are presented in Table 1. Furthermore, the students were categorized into three groups (low, moderate, and high) based on their total scores of each variable. This grouping procedure was conducted using the proportional split method (DeCoster et al., 2011), which is a widely used technique for creating artificial categories from continuous variables when there are no natural thresholds or cut points. The proportional split method was adopted in this study following the precedent of previous studies on students' emotions in the EFL learning contexts (Li, 2020; Shao et al., 2013; Zhao & Yang, 2022). Based on this standard, the total score of enjoyment ranged from 10 to 50, where below 30 indicated a low level, between 30 and 40 indicated a moderate level, and above 40 indicated a high level. Hope and pride ranged from 6 to 30, where below 18 indicated a low level, between 18 and 24 indicated a moderate level, and above 24 indicated a high level. For boredom, awareness, goal, and emotion controls, the range was from 4 to 20, where below 12 indicated a low level, between 12 and 16 indicated a moderate level, and above 16 indicated a high level.

Table 1 shows that most students had low and moderate positive emotions and self-regulatory capacity in EFL learning. Specifically, for positive emotions, the mean of students' enjoyment was 29.66 (<30), indicating that most students experienced low enjoyment. The mean of students' hope was 18.51 (>18), suggesting that most students perceived moderate hope. The mean of students' pride was 16.23 (<18), revealing that most students held low pride. These conclusions were supported by the median and mode values. For self-regulatory capacity, the mean of students' boredom control was 12.10 (>12), indicating that most students perceived moderate boredom control. The means of students' awareness, goal, and emotion controls were 11.67, 11.37, and 11.57 (all <12), suggesting that most students were low in these controls. The median and mode values also confirmed these conclusions. Moreover, the normality of the data was confirmed by the values of Skewness and Kurtosis in Table 1 (Field, 2009). This ensured that the data met the assumptions for further analyses in the subsequent sections.

5.2. Correlations among positive emotions, self-regulatory capacity, and EFL performance

To answer the second research question, Pearson correlation analyses were performed to test the correlations among students' positive emotions, self-regulatory capacity, and EFL performance. According to Plonsky and Oswald (2014), 0.25 is considered as a small effect size, 0.40 as a moderate effect size, and 0.60 as a large effect size.

It was found that the three positive emotions were significantly and positively linked to the four controls of self-regulatory capacity with a

Table 1
Descriptive statistics for positive emotions and self-regulatory capacity ($n = 330$).

Variable	Mean	SD	Median	Mode	Skewness	Kurtosis
Enjoyment	29.66	6.63	29	26	0.195 (0.160)	−0.723 (0.320)
Hope	18.51	3.39	18	16	0.833 (0.160)	0.338 (0.320)
Pride	16.23	5.01	15	15	0.422 (0.160)	−0.536 (0.320)
Boredom control	12.10	3.24	12	12	0.223 (0.160)	−0.776 (0.320)
Awareness control	11.67	3.20	11	11	0.340 (0.160)	−0.668 (0.320)
Goal control	11.37	2.80	11	9	0.120 (0.160)	−0.661 (0.320)
Emotion control	11.57	3.12	11	10	0.291 (0.160)	−0.603 (0.320)

Note: SD = standard deviation.

large effect size (see Table 2). More specifically, students' enjoyment was positively correlated with the four controls ($r = 0.604, 0.578, 0.583$, and 0.648 , respectively, $p < 0.05$). Hope was positively associated with the four controls ($r = 0.570, 0.592, 0.516$, and 0.576 , $p < 0.05$). Pride was also positively connected with the four controls ($r = 0.683, 0.664, 0.600$, and 0.710 respectively, $p < 0.05$). In addition, the four controls of self-regulatory capacity were found to be significantly and positively related to EFL performance with a large effect size ($r = 0.727, 0.682, 0.662$, and 0.719 respectively, $p < 0.05$).

5.3. Mediating role of self-regulatory capacity between positive emotions and EFL performance

To answer the third research question, we employed PROCESS V3.3 (Model 4) developed by Hayes to testify the mediation effects of the four components of self-regulatory capacity in the relationship between enjoyment and EFL performance (Hayes et al., 2017). The results are indicated in Fig. 2.

According to Fig. 2, enjoyment significantly and positively predicted boredom control ($\beta = 0.604, p < 0.05$), awareness control ($\beta = 0.578, p < 0.05$), goal control ($\beta = 0.583, p < 0.05$), emotion control ($\beta = 0.648, p < 0.05$), and EFL performance ($\beta = 0.524, p < 0.05$). Boredom control ($\beta = 0.257, p < 0.05$) and awareness control ($\beta = 0.120, p < 0.05$) significantly and positively predicted EFL performance. Goal control ($\beta = 0.063, p > 0.05$) and emotion control ($\beta = 0.053, p > 0.05$) didn't significantly predict EFL performance.

Bootstrap sampling using 5000 interactions with a confidence interval (CI) of 95 % was utilized to examine the significance of the mediation model. As can be seen from Table 3, the CI of pathways 1 and 2 didn't include 0, indicating that boredom control and awareness control collectively mediated the effect of enjoyment on EFL performance. However, 0 was included in the CI of pathways 3 and 4, showing that the mediation effects of goal control and emotion control were not significant. When the four controls entered the regression equation as the predictor variables of EFL performance, the indices suggested the mediation model was well-fitted ($R = 0.863, R^2 = 0.744, F = 130.362, p < 0.05$), and enjoyment still positively predicted EFL performance ($\beta = 0.509, p < 0.05$) but with a smaller effect size. The results of multicollinearity test indicated that there was no multicollinearity problem between these variables (all the tolerance values > 0.1 , variance inflation factor (VIF) values < 10) (Tabachnick & Fidell, 2013).

To examine the mediating role of self-regulatory capacity in the association between hope and EFL performance, four components of self-regulatory capacity were tested as potential mediators. The mediation model and the results are depicted in Fig. 3. As can be seen from Fig. 3, hope significantly and positively predicted boredom control ($\beta = 0.571, p < 0.05$), awareness control ($\beta = 0.592, p < 0.05$), goal control ($\beta = 0.516, p < 0.05$), emotion control ($\beta = 0.575, p < 0.05$), and EFL performance ($\beta = 0.388, p < 0.05$). Boredom control ($\beta = 0.279, p < 0.05$), goal control ($\beta = 0.127, p < 0.05$), and emotion control ($\beta = 0.173, p < 0.05$) significantly and positively predicted EFL performance. Emotion control ($\beta = 0.057, p > 0.05$) didn't significantly predict EFL performance.

Table 2

Correlations among positive emotions, self-regulatory capacity and EFL performance ($n = 330$).

Variable	1	2	3	4	5	6	7	8
Enjoyment	–	–	–	–	–	–	–	–
Hope	0.725*	–	–	–	–	–	–	–
Pride	0.819*	0.776*	–	–	–	–	–	–
Boredom control	0.604*	0.570*	0.683*	–	–	–	–	–
Awareness control	0.578*	0.592*	0.664*	0.746*	–	–	–	–
Goal control	0.583*	0.516*	0.600*	0.713*	0.741*	–	–	–
Emotion control	0.648*	0.576*	0.710*	0.805*	0.774*	0.766*	–	–
EFL performance	0.796*	0.704*	0.814*	0.727*	0.682*	0.662*	0.719*	–

* $p < 0.05$.

The results of the mediation analysis showed that hope had an indirect effect on EFL performance through boredom, goal, and emotion controls, as the CI of pathways 1, 3, and 4 did not contain 0 (see Table 4). However, the indirect effect of hope through awareness control was not significant, as the CI of pathway 2 included 0. The mediation model had a good fit to the data ($R = 0.826, R^2 = 0.683, F = 96.518, p < 0.05$), and hope remained a positive predictor of EFL performance, albeit with a small effect size ($\beta = 0.366, p < 0.05$), after controlling for the four types of control variables. Additionally, there was no multicollinearity issue among the variables, as all the tolerance values were above 0.1 and all the variance inflation factor (VIF) values were below 10 (Tabachnick & Fidell, 2013).

The mediating role of self-regulatory capacity in the association between pride and EFL performance was also examined. Fig. 4 displays the results of this analysis. As shown in Fig. 4, pride had a significant and positive direct effect on EFL performance ($\beta = 0.550, p < 0.05$), as well as on boredom, awareness, goal, and emotion controls ($\beta = 0.682, 0.663, 0.599$, and 0.708 respectively, $p < 0.05$). Among the four types of control variables, only boredom control ($\beta = 0.207, p < 0.05$) and goal control ($\beta = 0.132, p < 0.05$) had significant and positive direct effects on EFL performance. Awareness control ($\beta = 0.048, p > 0.05$) and emotion control ($\beta = 0.038, p > 0.05$) did not have significant direct effects on EFL performance.

The results of the mediation analysis revealed that pride influenced EFL performance indirectly through boredom control and goal control, as the CI of pathways 1 and 3 did not contain 0 (see Table 5). However, the indirect effects of pride through awareness control and emotion control were not significant, as the CI of pathways 2 and 4 included 0. The mediation model had a good fit to the data ($R = 0.853, R^2 = 0.733, F = 122.815, p < 0.05$), and pride remained a significant and positive predictor of EFL performance, albeit with a small effect size ($\beta = 0.540, p < 0.05$), after controlling for the four types of control variables. Additionally, there was no multicollinearity issue among the variables, as all the tolerance values were above 0.1 and all the variance inflation factor (VIF) values were below 10 (Tabachnick & Fidell, 2013).

6. Discussion

Based on the CVT, this study aimed to explore the relationship between positive emotions, self-regulatory capacity, and EFL performance. The specific objectives of this study were threefold: first, to probe the general tendencies of Chinese senior high school students' positive emotions and self-regulatory capacity; second, to test the correlation among these variables; and third, to examine whether the four components of self-regulatory capacity mediated the relationship between the three positive emotions and EFL performance.

To address the first research question, we explored the general tendencies of students' positive emotions and self-regulatory capacity in EFL learning. Descriptive analyses revealed that the majority of students reported low levels of enjoyment and pride, and moderate levels of hope, suggesting that most senior high school students experienced relatively low positive emotions in their EFL learning. This finding is inconsistent with the studies of Dong et al. (2022) and Feng and Hong (2022), who

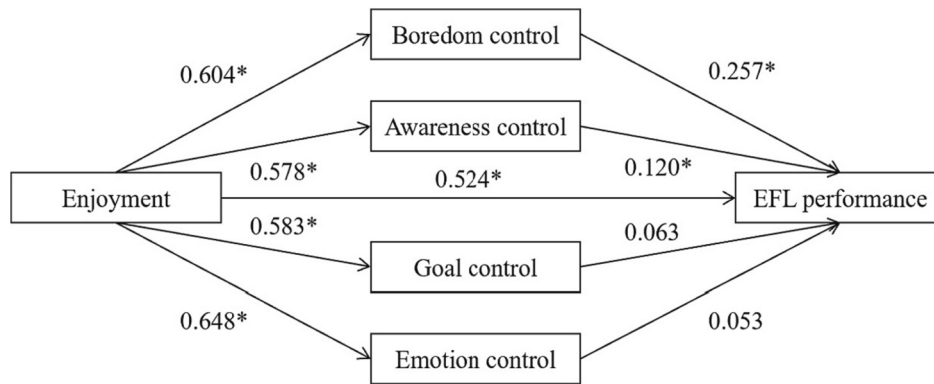


Fig. 2. Mediation effects of self-regulatory capacity between enjoyment and EFL performance
Note: *, $p < 0.05$; all data were completely standardized.

Table 3
Analysis of self-regulatory capacity's mediating role between enjoyment and EFL performance.

Pathway	Effect size	SE	BCa95%CI
1. Enjoyment→Boredom control→EFL performance	0.155	0.038	[0.074, 0.242]
2. Enjoyment→Awareness control→EFL performance	0.069	0.034	[0.003, 0.135]
3. Enjoyment→Goal control→EFL performance	0.037	0.035	[−0.029, 0.107]
4. Enjoyment→Emotional control→EFL performance	0.034	0.044	[−0.056, 0.118]

Note: All data were completely standardized; SE = standard error.

found a moderate to high level of enjoyment among Chinese senior high school students. A possible explanation for this discrepancy is that our sample consisted of third-year senior high school students who faced the upcoming college entrance examination. The high expectations and pressure from themselves and their parents for the exam performance may have increased their stress and depression, which in turn may have reduced their enjoyment and pride in EFL learning (Liu et al., 2020; Zhang et al., 2016). As for students' perceived hope, it was slightly higher than enjoyment and pride, reaching a moderate level, which corroborates the finding of Yu et al. (2022). They argued that relatively high hope was prevalent among Chinese senior high school students, which might be attributed to cultural factors. One of these factors is Confucianism, a worldview and ethical system that has influenced Chinese culture for more than two millennia. Confucianism emphasizes

the importance of education, moral character, and social harmony. It also teaches that effort can overcome one's limitations and improve one's academic performance. This effort belief may enable Chinese senior high school students to be hopeful even under tremendous pressure from the exam (Chen et al., 2018; Hau & Ho, 2012). Therefore, the relationship between cultural beliefs and hope can be understood in light of the Confucian tradition and its influence on Chinese society.

Another main finding of this study was that Chinese senior high school students' perceived self-regulatory capacity in EFL learning was generally low, particularly in terms of awareness, goal, and emotion controls. This finding suggests that most students were deficient in their capacity to exclude inner and outer distractions, set and achieve academic goals, and control and regulate diverse emotions in their EFL learning. It contradicts some previous studies that reported higher levels of self-regulatory capacity among EFL learners in different contexts (Liu

Table 4
Analysis of self-regulatory capacity's mediating role between hope and EFL performance.

Pathway	Effect size	SE	BCa95%CI
1. Hope→Boredom control→EFL performance	0.159	0.046	[0.067, 0.248]
2. Hope→Awareness control→EFL performance	0.034	0.039	[−0.043, 0.108]
3. Hope→Goal control→EFL performance	0.066	0.034	[0.004, 0.133]
4. Hope→Emotional control→EFL performance	0.099	0.042	[0.014, 0.178]

Note: All data were completely standardized; SE = standard error.

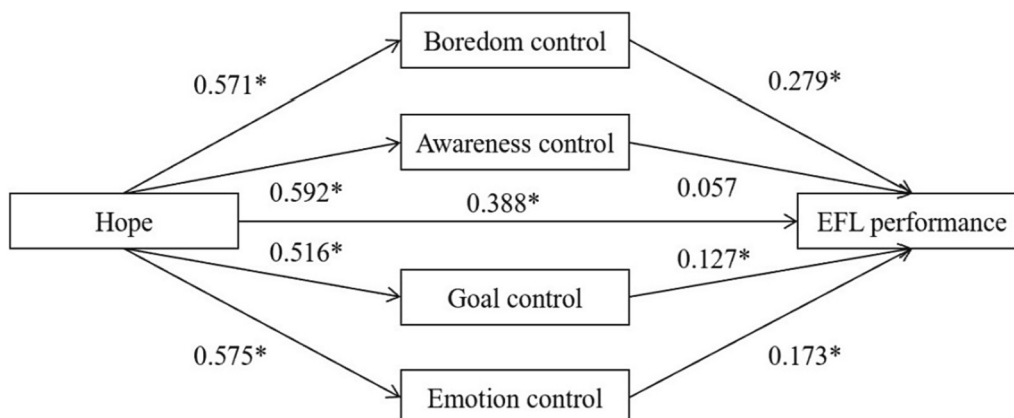


Fig. 3. Mediation effects of self-regulatory capacity between hope and EFL performance
Note: *, $p < 0.05$; all data were completely standardized.

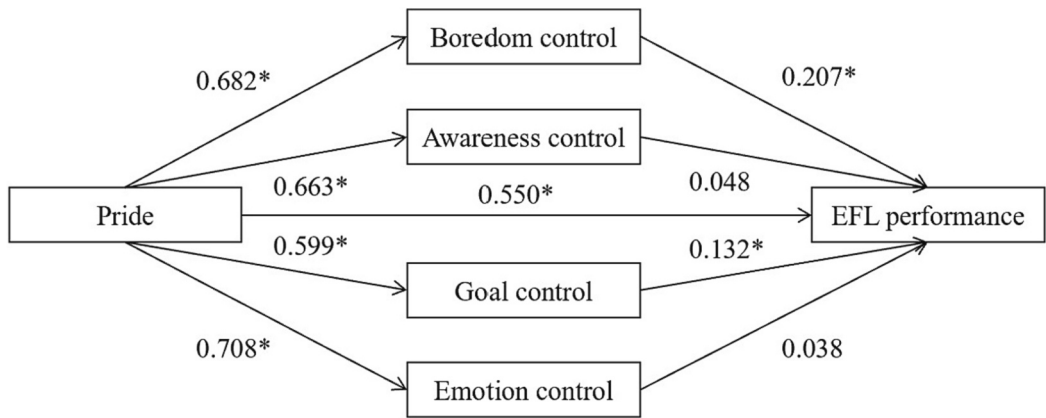


Fig. 4. Mediation effects of self-regulatory capacity between pride and EFL performance
Note: *, $p < 0.05$; all data were completely standardized.

Table 5
Analysis of self-regulatory capacity's mediating role between pride and EFL performance.

Pathway	Effect size	SE	BCa95%CI
1. Pride→Boredom control→EFL performance	0.141	0.049	[0.045, 0.237]
2. Pride→Awareness control→EFL performance	0.032	0.041	[−0.047, 0.112]
3. Pride→Goal control→EFL performance	0.079	0.037	[0.009, 0.155]
4. Pride→Emotional control→EFL performance	0.027	0.050	[−0.074, 0.120]

Note: All data were completely standardized; SE = standard error.

& Lee, 2015; Tseng et al., 2006). A possible explanation for this discrepancy is that the participants in our study were third-year senior high school students, thus facing more challenges and pressures in their EFL learning than their counterparts in other settings (Gao et al., 2022; Zhu et al., 2017). They might have failed to reasonably manage and distribute their time on the excessive homework from compulsory disciplines (Xu & Corno, 2022), which might have interfered with their awareness and goal controls in EFL learning. Moreover, the frequent exams for compulsory disciplines might have induced a fluctuation of students' emotions such as pride, shame, and self-loathing (Fang et al., 2022), which might have hindered their emotion control in EFL learning. On the other hand, we found that students' capacity to handle boredom in EFL learning was slightly moderate. This might imply that they had developed some coping strategies to deal with the internal and external factors that triggered their boredom in EFL learning, such as task characteristics, teaching and learning activities, student factors, etc. (Li & Han, 2022).

To answer the second research question, we conducted correlation analyses to examine the relationship among positive emotions, self-regulatory capacity, and EFL performance. The results revealed a significant relationship among these variables. Specifically, enjoyment, hope, and pride were positively correlated with awareness, goal, emotion, and boredom controls as components of self-regulatory capacity. This suggested that students who experienced more positive emotions in EFL learning had higher capacity to eliminate distractions, set and achieve goals, regulate emotions, and cope with boredom. These findings were consistent with previous studies in general education that found significant and positive correlations between enjoyment, hope, and pride and students' self-regulated learning strategies and behaviors (Artino & Jones, 2012; You & Kang, 2014; Zheng & Li, 2016). Additionally, each component of self-regulatory capacity was positively related to EFL performance as indicated by students' scores in the final exam. This supported the findings of previous studies that showed

positive relationships between self-regulated learning and specific aspects of EFL performance such as listening comprehension, reading comprehension, vocabulary knowledge, and writing skills (Adigüzel & Orhan, 2017; Chen et al., 2022; Teng, Wang, et al., 2022). Hence, our study confirmed this positive relationship between self-regulated learning and EFL performance from a general perspective.

With respect to the third research question, we performed mediation analysis to explore whether self-regulatory capacity mediated the effect of positive emotions on students' EFL performance. The results revealed a partial mediation effect, which was consistent with the previous studies in general education (Mega et al., 2014; Zheng & Li, 2016). In particular, enjoyment exerted a direct and indirect effect on students' EFL performance through affecting their boredom control and awareness control with boredom control as a stronger mediator. This could be attributed to the fact that enjoyment could help students enhance their ability to handle negative emotions including boredom, and enable them to be more engaged in learning materials and less likely to be distracted (Fredrickson, 2001; Zhao & Yang, 2022). Similarly, hope exerted a direct and indirect effect on students' EFL performance through boredom control, goal control, and emotion control with the first control with boredom control as the strongest mediator. This could be explained by Snyder's hope theory (2002), which states that individuals with high hopes are usually well-performed learners, as they are better at handling negative emotions, controlling their emotions, and setting and executing plans for achieving desired learning goals with greater effectiveness. Likewise, pride exerted a direct and indirect effect on students' EFL performance through influencing their boredom control and goal control with boredom control as a stronger mediator. This could be based on Zimmerman and Cleary's (2009) argument that learners with an awareness of satisfaction and fulfillment with their performance can increase their perceived value on academic tasks and encourage them to strive for completing these tasks, thereby making them more boredom-resistant and goal-driven. It worth mentioning that an important finding of this study is that boredom control was the most powerful mediator in all three mediation models, indicating that controlling boredom is crucial for EFL learning and suggesting that boredom has a tremendous negative influence on EFL learning. This is consistent with Li et al. (2022), who reported that boredom was a more potent inhibitor of students' willingness to communicate in EFL class than anxiety, a negative emotion that has been dominantly investigated by language researchers for decades. Besides, the effect of these emotions on EFL performance by means of different components of self-regulatory capacity offered empirical evidence in the field of EFL learning for supporting the proposition of the CVT that positive achievement emotions affect academic achievement by means of a series of cognitive mechanisms including self-regulation (Pekrun & Perry, 2014).

This study has yielded some important findings that have

implications for Chinese EFL teachers. Based on these findings, we propose the following recommendations. First, teachers should foster students' positive emotions, which are crucial for their self-regulatory capacity and EFL performance. Our study revealed that students' positive emotions were relatively low and significantly predicted their self-regulatory capacity and EFL performance. Therefore, teachers could adopt some strategies to enhance students' positive emotions, such as: (1) implementing emotion-based language instruction to infuse emotional elements into language learning and stimulate students' interest and enjoyment (Pishghadam et al., 2013; Pishghadam et al., 2019), (2) guiding students to attribute their EFL outcomes to their effort rather than their competence, which could increase their pride and hope (Weiner, 1985, 1992, 2007), and (3) providing stress management programs that include psychoeducation, coping skills training, and supportive atmosphere to help students cope with academic stress and improve their well-being (Pan et al., 2023; Zhou et al., 2023). Second, teachers should cultivate students' self-regulatory capacity, which is essential for their EFL performance. Our study showed that students' self-regulatory capacity was relatively low and had a significant impact on their EFL performance. Therefore, teachers could employ some strategies to improve students' self-regulatory capacity, such as: (1) offering instruction and guidance for self-regulated learning strategies in class or in authentic settings, or integrating both approaches (Zhang & Zou, 2022), and (2) assisting students in setting realistic and feasible goals and plans for EFL learning, and helping them allocate their time rationally among multiple disciplines, which could enhance their awareness control and goal control.

This study makes several novel contributions to emotion studies in EFL learning. First, this is the first study to examine the relationship between positive emotions, self-regulatory capacity, and EFL performance among Chinese senior high school students, a demographic that has been largely neglected in previous research. Second, we empirically validated the CVT's assumption that achievement emotions influence learners' academic achievement through cognitive factors such as self-regulation (Pekrun & Perry, 2014) in the context of EFL learning, by demonstrating the mediating role of self-regulatory capacity in this relationship. Third, we identified which specific components of self-regulatory capacity mainly mediated the indirect effect of enjoyment, hope, and pride on EFL performance, providing detailed insights into the mediating mechanism and theoretical guidance for interventions aiming to enhance students' EFL performance through fostering their positive emotions and self-regulatory capacity.

This study is not without limitations that warrant further attention. First, the sample size of this study was relatively small, as it only included data from three senior high schools in China. Therefore, the results may not be representative of the larger and more diverse population of Chinese senior high school students. Therefore, future research should employ a larger and more diverse sample to enhance the external validity and reliability of the results. Second, this study did not examine the potential bidirectional relationship between self-regulated learning and positive emotions, as self-regulated learning also entails regulating emotions. Therefore, future research could investigate the mediation mechanism and the reciprocal causality underlying the relationship between these variables. For example, a longitudinal design with multiple measurements of both variables could be employed to capture the dynamic and bidirectional relationship between self-regulated learning and positive emotions. Third, the scale used to measure participants' self-regulatory capacity had two dimensions that seemed somewhat overlapping: "boredom control" and "emotion control". Since boredom is also a kind of emotion, these two dimensions may not be clearly distinct from each other. Future research may need to develop a scale that has clearer and more specific dimensions of self-regulatory capacity. Fourth, we measured the students' emotional states right before a high-stakes exam, which might have influenced their responses. The students might have experienced more intense emotions than they would in their regular EFL situations. This may have introduced a

measurement bias that could skew the results. Future studies could use multiple measurements of emotional states at different points of the learning process to capture a more comprehensive and accurate picture of the affective factors involved in EFL learning. Fifth, we did not examine the potential moderating effects of variables such as socio-economic status, prior EFL experience, and gender. Future studies could benefit from exploring how these variables interact with emotions, self-regulated learning, and EFL performance.

7. Conclusion

This study aimed to investigate the following three aspects among Chinese senior high school students: (1) the general tendencies of positive emotions (enjoyment, hope, and pride) and self-regulatory capacity, (2) the relationships between positive emotions, self-regulatory capacity, and EFL performance, and (3) the mediating role of self-regulatory capacity in the effects of positive emotions on EFL performance. The main findings were as follows: (1) the students reported low levels of enjoyment and pride, moderate levels of hope, and low to moderate levels of self-regulatory capacity; (2) all the variables were significantly interrelated and positively associated with EFL performance; and (3) self-regulatory capacity partially mediated the effects of positive emotions on EFL performance. Specifically, boredom and awareness controls mediated the relationship between enjoyment and EFL performance; boredom, goal, and emotion controls mediated the relationship between hope and EFL performance; and boredom and goal controls mediated the relationship between pride and EFL performance. The CVT's cognitive-motivational model is supported by these findings. They imply that Chinese EFL teachers should use strategies that can increase positive emotions and self-regulatory capacity in their students, as these can improve their EFL performance. To overcome the limitation of this study, future research could employ a larger and more diverse sample to explore the potential bidirectional causality between the variables in this study.

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Declaration of competing interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Data availability

Data will be made available on request.

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