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| RESEARCH ARTICLE

How Reading Enjoyment and Self-regulated Learning Contribute to Reading Performance in a Confucian Context?

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| ABSTRACT

Although positive emotions are widely considered one of the crucial factors affecting individual academic performance, few studies have explored how such effects are mediated by other metacognition and motivational factors in self-regulated learning, taking into account certain cultural-educational contexts. Therefore, this study attempted to investigate the interrelationships among Chinese students' reading enjoyment, metacognition, approach achievement goals, growth mindset, and reading achievement based on the PISA 2018 dataset. Research findings revealed that (i) reading enjoyment, metacognition, approach achievement goals and growth mindset could positively predict reading performance, but the correlation between a growth mindset and reading enjoyment was negative among Chinese students; (ii) reading enjoyment affects reading performance directly and indirectly, and the indirect influence was mediated by students' metacognition, approach achievement goals, and growth mindset. This study validates a multiple-parallel mediation model to associate positive emotion and reading achievement via self-regulation. The findings provide implications for enhancing students' motivation in learning and emotional well-being in Confucian countries.

| KEYWORDS

Reading Enjoyment, Self-regulated Learning, Metacognition, Achievement Goals, Growth Mindset.

| ARTICLE INFORMATION

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1. Introduction

Over the past ten years, research on positive emotion in the educational sector has gained prominence, driven by the positive psychology (PP) movement (Carmona-Halty et al., 2021; Saleem et al., 2022). Being one of the most common emotional experiences, enjoyment proves to be a significant predictor of an individual's mental health as well as learning achievement (Li, 2020). However, it ought to be borne in mind that enjoyment might not be sufficient to ensure academic achievement on their own, which implies several mediating mechanisms, i.e., self-regulated learning and motivation, are also believed to be responsible for the effect (Mega et al., 2014). Nevertheless, the existing research on emotion was typically fragmented, and there appears to be a dearth of empirical investigations based on an integrated conceptual framework. Moreover, the intensity of emotions and demonstration ways of emotion could vary across different cultural-educational contexts (Pekrun, 2006), but few studies examine skill-specific enjoyment, taking into account contextual factors. Therefore, the present study attempts to examine how positive emotion combined with factors in self-regulated learning contributes to Chinese students' reading performance based on the Control-Value Theory (CVT). Specifically, we intend to clarify whether metacognition, approach achievement goals, and growth mindset work in parallel to mediate the relationship between reading enjoyment and reading performance in PISA 2018 data. A more robust statistical analysis helps shed light on how positive emotion affects students' academic achievement and provides practical pedagogical implications for the improvement of both reading performance and well-being among learners in Confucian countries and beyond.

2. Literature

2.1. Positive emotion and academic performance

Academic settings trigger a vast array of different emotions, such as enjoyment arising from acquiring new knowledge, test anxiety due to high-stakes examinations, anger when dealing with difficulties, boredom during online lectures, etc. (Bieleke et al., 2021). Pekrun (2006) defined achievement emotions as emotions that are directly tied to competence-relevant activities or results, which serve as the basis for positive emotions. According to CVT, two categories of achievement emotions may be identified based on *the object focus*, namely outcome emotions (i.e., hope, anxiety) and activity emotions (i.e., enjoyment, boredom) (Pekrun, 2006). Prior studies on achievement emotions have mostly examined the negative aspects associated with academic results, with anxiety receiving the greatest attention (Dewaele & Li, 2020). Inspired by the emergence of PP and its key principles of enhancing students' academic success and well-being simultaneously, increasing attention has been given to positive emotions in the learning process. (Pavelescu & Petrić, 2018).

Enjoyment, as a typical activity-related positive emotion experienced by learners, has been subject to considerable discussion. There is a substantial body of data indicating that there is either no significant association or even a negative link between these two constructs (Camacho-Morles et al., 2021) despite the majority of studies reporting a moderately favorable correlation between enjoyment and academic success (Li & Wei, 2023; Tahmouresi & Papi, 2021). This inconsistency might be due to a lack of skill-specific and integrated theoretical perspectives on the underlying mechanism between activity emotions and learning outcomes. That is to say, certain mediating processes might help explain the controversies on the association between enjoyment and academic performance. Moreover, It has been pointed out that students' attempts and capacities to control their emotions during the learning process may determine how much emotions influence their motivation, learning behaviors, and academic performance. (Harley et al., 2019). That suggests that there are bound to be complicated connections between positive emotions and academic achievement, which requires further investigation. Therefore, from a skill-specific perspective, the study seeks to elucidate the intricate relationships between positive emotions and academic performance based on an integrative conceptual framework, which encompasses participants' metacognitive, and motivational factors closely related to self-regulated learning.

2.2. Self-regulated learning and academic performance

As defined by Pintrich (2000), self-regulated learning (SRL) is a process in which learners formulate learning objectives and strive to monitor, regulate, and supervise their motivation, behavior, and cognition to achieve the intended goal (p. 453). SRL involves metacognition, motivation, and strategic action, helping enhance academic achievement by assisting students in actively utilizing strategies that increase motivation and perseverance (Theobald, 2021). Metacognition constitutes the fundamental part of SRL, encompassing the mental process that governs a learner's awareness and regulation of cognitive activities (Zimmerman, 2002), along with regulation execution during learning (Pintrich & De Groot, 1990). A considerable amount of literature confirmed the crucial role of metacognition in dealing with difficult elements of learning (i.e., reading and math) by helping students reflect on what they are thinking or what they already understand (Muncer et al., 2022). Iwai (2011) claimed that metacognition contributes to reading comprehension by facilitating linguistic, cognitive, and social skills during reading comprehension. Consistent with previous results, Sutiyatno (2019) confirmed the significant correlation between metacognition strategies and English reading achievement via a quantitative approach. Rivas et al. (2022) also supported the key role of metacognition in learning by discovering that it was closely tied to critical thinking, which helps better knowledge acquisition.

Another key element of SRL is motivation or motivational beliefs: learners will only take advantage of metacognitive strategies for assisting self-regulation, provided they are internally or externally inspired by learning. (Pintrich, 2000). Motivation regulation is believed to be best illuminated by achievement goals theory (Kaplan & Maehr, 2002), which describes achievement goals as the objectives that students pursue when participating in academic settings (Elliot & Hulleman, 2017). Early studies divided achievement goals into two categories: mastery goals, which emphasize the development of one's ability, and performance goals, which stress the intention of demonstrating one's ability (Ames, 1992). Then, four categories of achievement goals have been identified by more recent studies, which have additionally included the approach-avoidance dimension (Elliot & Thrash, 2002). The 2x2 taxonomy makes early discrepancies in the performance goal findings less confusing. (Elliot et al., 2011). Approach motivation tends to predict higher academic performance, while avoidance motivation is related to lower academic performance (Huang, 2012). By applying the latter categorization, the present study solely considers the mastery-approach goals (MAG) and performance-approach goals (PAG), which may help students succeed academically.

A growth mindset (GM) as a key motivational construct also appears to be closely associated with SRL and academic success (Mega et al., 2014). An ideal leaner with GM tends to regard his/her intelligence as malleable, and it could be improved through hard work (Dweck, 2006). GM was extensively reported to improve learning engagement, experiences, and outcomes (Chen & Wong, 2015). Cho et al. (2021) revealed that GM positively predicted American primary students' L1 reading comprehension development via a longitudinal research design. Yu and McLellan (2020) found that some high achievers with GM take the initiative to establish

mastery goals and push themselves to achieve these aims, but certain GM holders who were not goal-orientated also performed well in exams. The results imply that GM might play a composite role with other motivational factors, highlighting the dynamic interaction of various individual factors. Sisk et al. (2018) discovered a weak association between academic success and GM based on meta-analyses. Yan et al. (2021) found that GM was only positively associated with reading achievement in Western nations, but not in Confucian countries. These findings altogether suggest the potential indirect role of GM in learning, and its positive role might be enhanced by other cognitive and emotional factors.

2.3. Positive emotion and self-regulated learning

Positive emotions (i.e., enjoyment, hope) as a metric for the assessment of the quality of a student's academic life have a strong connection with learners' SRL, which also helps, in turn, upgrade learning experiences and enhance positive emotions among learners as an efficient strategy (Huang, 2022). Many psychologists have come to realize the crucial role of positive emotions in recent decades thanks to PP and contend that it might impact students' ability to regulate their learning. For example, Perry et al. (2008) believed that pupils who have greater hope levels are better able to deploy proper strategies to accomplish their objectives. Besides, a plethora of relevant empirical studies have demonstrated the noteworthy influence of positive emotions on metacognition in self-regulation, including the monitoring and regulation of performance and metacognitive awareness and skills (Chen et al., 2021; Tsai et al., 2018; Wang & MacIntyre, 2021). Positive emotions have been shown to support declining motivation in the language learning process (Dewaele, Saito, et al., 2023), intertwined with other motivation factors (i.e., growth mindset (Hu et al., 2022)).

Most research in the past examined how cognitive, metacognitive, motivational, and affective factors influence learning outcomes in a separate manner, while scholars nowadays have turned to perceive these factors as intertwined and integrated and conduct empirical research based on an integrated theoretical model. Bown (2009) discovered that emotional factors might influence the application of self-regulatory strategies. Likewise, Asikainen et al. (2018) revealed that emotions were significantly associated with SRL, which ultimately affected students' academic achievement. Ramirez-Arellano et al. (2019) detected the specific impact of students' learning motivation, cognitive-metacognitive strategies, and behavior on academic performance and found six factors significantly explaining roughly 67% of the variance in terms of final scores. Hayat et al. (2020) also confirmed that emotions might influence metacognitive strategies, which would have a visible impact on academic performance.

In sum, the existing literature clarifies the correlations between positive emotions and SRL and their crucial role in students' academic performance, but few studies examined the underlying mechanism behind these factors in a given task situation. Therefore, the current study attempts to clarify the potential mediating roles of metacognitive and motivational factors in SRL between reading enjoyment and reading achievement among Chinese students.

2.4. Theoretical framework and hypotheses

As mentioned before, most studies focused separately on the impact of emotion, cognition, and motivation on academic performance and yielded inconsistent results, with limited attention given to the interconnection of these constructs. Furthermore, relatively few empirical studies have been committed to evaluating whether the effects of skill-based emotions could be reinforced by certain mediation processes, paying attention to certain contextual factors, since students' emotions may vary across different tasks (i.e., reading or speaking) and cultural backgrounds (Western or Confucian culture) (Pekrun et al., 2011). Therefore, it is imperative to examine the relationships between positive emotions and academic performance, considering the mediating role of other individual variables, which are also crucial for academic success.

Based on CVT and relevant research findings, Mega et al. (2014) claim that positive emotions could contribute to academic achievement via certain mediators, including metacognitive strategies, GM, and approach achievement goals, and propose a theoretical model associating emotions, SRL, and motivational factors with academic achievement. The model provides preliminary evidence that positive emotions might predict academic performance via approach achievement goals, metacognition, and GM.

Therefore, we developed a mediation model based on the CVT and Mega et al.'s theoretical model to reveal the complex interrelationships among reading enjoyment, metacognition, approach achievement goals (namely MAG, PAG), GM, and reading achievement in the Chinese learning context. Specifically, it proposes two specific research questions (RQs).

RQ1: What are the direct relationships among reading enjoyment, metacognition, MAG, PAG, GM, and reading achievement among Chinese students?
RQ2: Do metacognition, MAG, PAG, and GM play mediating roles in relationships between reading enjoyment and reading achievement?

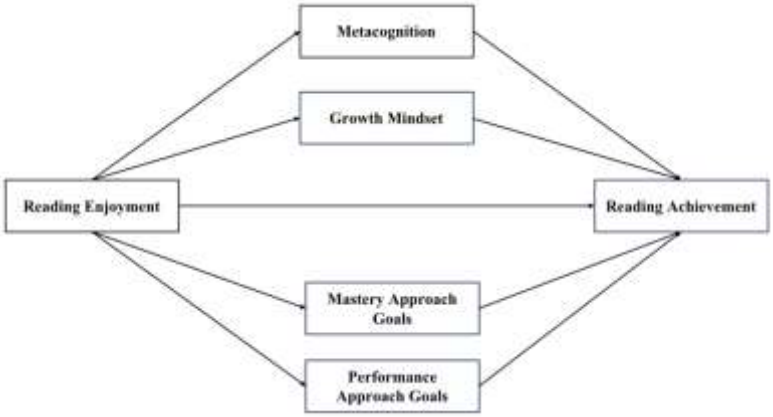

Figure 1 Illustration of the multiple mediation model

3. Method

3.1 Data and selection of participants

PISA 2018 represents a global assessment study to test the knowledge and skills in science, reading, and mathematics among students aged 15. The public data can be downloaded from the official website of the OECD, and no ethics clearance approval was required for the authors' data collection. Analyses in the present study were implemented based on mainland China data, including four provinces: Beijing, Shanghai, Jiangsu, and Zhejiang). SPSS 25.00 was used to select a total of 12,058 Chinese students, representing 992,302 15-year-old students in mainland China after weighting (female, 47.9%). Among them, junior high students made up 40.5% and seniors 59.5% of the total. It should be noted that 11413 students were included in the final analysis with missing values in the key variables dropped.

3.2 Measures

3.2.1 Reading enjoyment

Reading enjoyment was gauged with 5 items on a 4-point Likert scale, ranging from strongly disagree to strongly agree. A weighted total score provided by the PISA 2018 dataset was taken as a measure of each student's reading enjoyment.

3.2.2 Metacognition

The PISA 2018 presented three scenarios to evaluate metacognitive reading strategies, including understanding and memorizing text information, summarizing the given texts, and receiving unexpected information. Students were asked to assess how each strategy is effective in working out reading problems, using a 6 Likert scale. The present study used the average score of the three metacognitive reading strategies.

3.2.3 Approach achievement goals

Two scales of mastery goal orientation (5-point Likert scale) and competitiveness (4-point Likert scale) in the PISA 2018 questionnaire were used to represent two types of approach achievement goals. The weighted values of the two types of achievement goals were analyzed separately in the regression to avoid confounded research results.

3.2.4 Growth mindset

The PISA 2018 questionnaire had one question to evaluate students' growth mindset, which is "Our intelligence is something you can't change much." Students responded to the items by indicating to what extent they agreed with the statement on a scale from 1 (strongly disagree) to 4 (strongly agree). The score was reversed, and a higher score represented a stronger growth mindset.

3.2.5 Reading achievement

PISA 2018 reading assessment provides scores on a combined reading literacy scale, which consists of three subscales: locating information, understanding, and evaluating and reflecting. Students' reading literacy was reported via ten plausible values (PVs), and the current study included the weighted mean of 10 PVs for student reading achievement, as provided by PISA 2018.

3.2.6 Covariates

Demographic variables are also believed to have an impact on academic performance (Yang & Wang, 2023). Specifically, students with better socioeconomic status (SES) are more likely to enjoy reading activities and perform, more often than not, better in terms of reading tests compared with those with relatively poor SES (Rogiers et al., 2020). Meanwhile, relevant findings reported

significant differences in perceptions and beliefs in reading capacity between girls and boys (Korhonen et al., 2016). Consequently, in this study, two demographic covariates (gender and ESES) were considered in the data analysis.

3.3 Data analysis

Three steps were involved in the analysis process. First, the data were analyzed using descriptive and Pearson analysis with SPSS 25.00 to answer the first RQ. Then, Process v4.0 (Model 4), developed by Hayes (2012), was utilized to test the proposed multiple mediation model. Taking into account potential confounding variables, this study examined the possible mediating role of metacognition (MC), MAG, PAG, and GM between reading enjoyment (RE) and reading achievement (RA).

4. Results

4.1 Descriptive statistics and bivariate correlations

Table 1 demonstrates the bivariate correlations between constructs along with means (M) and standard deviations (SD). It can be seen that all the key variables in the present study are significantly linked to each other. Specifically, students' reading enjoyment, metacognition, MAG, PAG, and GM are positively linked to reading performance. However, to our surprise, a growth mindset is negatively associated with reading enjoyment, MAG, and PAG in the Chinese learning context. It is worth mentioning that all the significant correlations are either small or moderate, which implies that there is no multicollinearity issue.

Table 1 Bivariate correlations with M and SD

Variables	Mean	SD	1	2	3	4	5	6
1. RE	0.971	0.855	1					
2. MC	0.041	0.755	.155**	1				
3. MAG	-0.013	0.907	.251**	.020**	1			
4. PAG	0.409	0.812	.215**	.029**	.305**	1		
5. GM	2.350	0.886	-.091**	.071**	-.067**	-.099**	1	
6. RA	555.236	83.365	.320**	.504**	.152**	.125**	.121**	1

*Note: ** indicates statistical significance at a p<0.01.*

4.2 Mediating effect analysis

Based upon the Pearson correlation analysis, a series of stepwise regression analyses were run by Process v4.0 after controlling ESES and gender to examine the mediation effects of metacognition, MAG, PAG, and GM between reading enjoyment and reading achievement. The results of regression and mediation effects analyses are presented in Table 2.

Table 2 Regression results for the multiple mediator model

Regression Equations		**Fit Index**			**Coefficient**		
Predictor	**Outcome**	**R**	**R^2**	**F**	***β***	**B**	**t**
RE					.137	.122	14.571***
ESES	MC	.238	.0567	228.558***	.098	.068	10.590***
GEN					-.131	-.197	-14.230***
RE					-.107	-.114	-11.158***
ESES	GM	.151	.023	89.220***	.110	.092	11.646***
GEN					-.080	-.144	-8.517***
RE	PAG	.226	.0510	204.482***	.194	.187	20.594***
ESES					.083	.063	8.922***

Regression Equations		Fit Index			Coefficient		
Predictor	**Outcome**	**R**	**R^2**	**F**	***β***	**B**	**t**
GEN					.063	.102	6.786***
RE					.222	.238	23.815***
ESES	MAG	.268	.072	293.974***	.115	.096	12.461***
GEN					.013	.024	.0165
RE					.184	18.550	24.420***
MC					.466	52.640	64.659***
GM					.101	9.4789	14.126***
PAG	RA	.667	.445	1303.729***	.016	1.715	2.213*
MAG					.039	3.664	5.200***
ESES					.283	22.225	38.962***
GEN					.022	3.703	3.043**

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

According to Table 2, as for the link between the predictor and mediators, reading enjoyment could positively predict students' metacognition (β = .137, p < .001), MAG (β = .222, p < .001), and PAG (β = .194, p < .001), but it is negatively associated with GM (β = -.107, p < .001), with covariates, namely SES and gender controlled. Then, all variables were regressed sequentially on reading achievement in the same formula (R^2=.445, F=1303.729***, p <.001. The findings show that students' reading enjoyment (β = .184, p < .001), metacognition (β = .466, p < .001), GM (β = .101, p < .001), MAG (β = .039, p < .001), and PAG (β = .016, p < .001) all have a significantly positive effect on reading achievement.

After controlling ESES and gender, the mediating role of metacognition, MAG, PAG, and GM in the relationship between reading enjoyment and reading achievement was also examined with the total indirect/mediating effect size presented in Table 3.

Table 3 Analysis of the mediating effect

Pathway	Effect Size	SE	LLCI	ULCI	Indirect/total effect
Total Effect	25.0783	0.8572	23.3982	26.7585	100%
Direct Effect	18.5500	0.7596	17.0610	20.0390	73.97%
Indirect Effect	6.5283	0.5465	5.4529	7.6064	26.03%
Ind1(MC)	6.4142	0.4719	5.4775	7.3287	25. 58%
Ind2(GM)	-1.0776	0.1337	-1.3436	-0.8243	-4.30%
Ind3(MAG)	0.8705	0.1813	0.5177	1.2282	3.47%
Ind4(PAG)	0.3213	0.1566	0.0211	0.6323	1.28%

Note: All coefficients are unstandardized coefficients.

As shown in Table 3, reading enjoyment has a direct effect on reading achievement (B=18.5500, SE=0.7596, p<.001), taking up 73.97% of the total effect. Besides, the 95% confidence interval of the indirect effect, as we can see, doesn't straddle zero [5.4529, 5.4529], so we can conclude with 95% confidence that metacognition, MAG, PAG, and GM work in parallel to mediate the effect of reading enjoyment on reading achievement and the total indirect effect size was 6.5283, which accounts for 26.03% of the total effect. The specific multiple parallel mediation model is illustrated in Figure 2.

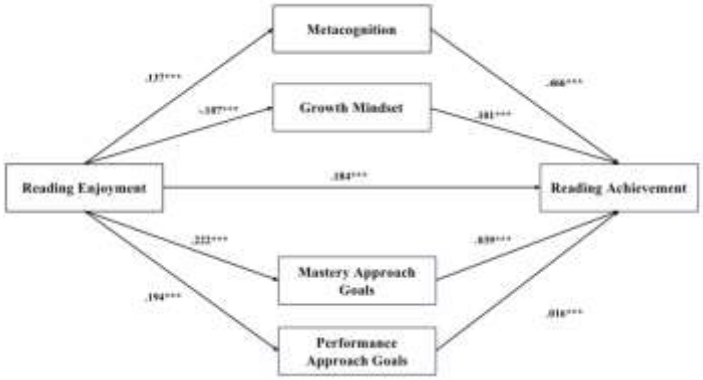

Figure 2 The statistical diagram of the parallel multiple mediator model

5. Discussion

Based on PISA 2018, the present research investigated relationships among reading enjoyment, factors in self-regulated learning (MAG, PAG, GM), and reading achievement by empirically testing a multiple-mediators model.

In terms of RQ1, the findings confirmed that reading enjoyment is positively related to reading achievement. The significant relation empirically supports the theoretical assumptions assumed by the CVT and echoes previous studies on the positive link between positive emotion and academic achievement (Dewaele, Botes, et al., 2023; Putwain et al., 2018). It suggests that a positive mood helps reduce fear of exams and tiredness of learning and increases learning efficiency by focusing on the teacher's instruction in a relaxed and comfortable atmosphere to ultimately achieve better results. Meanwhile, MAG, PAG, and GM were significantly positively related to reading achievement, which corresponds with most frameworks of SRL emphasizing a positive relationship between SRL and academic achievement (Efklides, 2011; Greene & Azevedo, 2010; Zimmerman, 2008).

Positive emotions have been proven to affect different aspects of SRL in the research, which provides data supporting the hypothesis that emotions could be a predictor of various facets of SRL (Mega et al., 2014). In particular, students' reading enjoyment is positively associated with students' perceptions of metacognitive strategies and approach achievement goals, which supports our proposed model and previous findings (Datu et al., 2022; Huang, 2011). This is probably because positive emotions help learners evaluate and reflect on their learning and performance, apply strategies in exams, and set appropriate goals. It should be noted that some scholars reported that approach achievement goals could also be predictors of emotions (Goetz et al., 2016). It implies that further research is required to disentangle the complex and causal relationships between emotions and achievement goals.

Surprisingly, the detected negative association between reading enjoyment and students' GM is inconsistent with the hypothesis model, which states that students' positive emotions could enhance their beliefs in the malleable nature of intelligence. This can be partly attributed to the different learning contexts and the participants' SES. Sun et al. (2021) discovered that Chinese students were more likely to hold fixed mindsets about intelligence compared with students in the US, which suggested that owing to differences in cultural backgrounds, GM might have a distinct impact on an individual's motivation to learn, as well as on the learning outcomes. In a similar vein, based on PISA 2018 Philippine data, growth mindset was reported to be significantly different among higher SES students and lower SES students, and no significant association was detected between GM and learning achievement among those with relatively social status (Bernardo, 2023).

As for the RQ2, the findings showed that metacognition, MAG, PAG, and GM collectively play mediating roles in the relationships between reading enjoyment and reading achievement. In other words, the influence of reading enjoyment on reading achievement might rest on the interaction of certain self-regulating factors. Our results empirically support CVT, which states that students' emotions affect their self-regulated learning process, which ultimately has an impact on academic achievement. It is reasonable to

suppose that positive emotions by themselves are not enough to ensure academic performance, as metacognitive and motivational factors in SRL also contribute to improving and maintaining academic performance. However, to our surprise, GM negatively affected the relationship between reading enjoyment and reading achievement. It suggested that general GM is not necessarily positively related to emotional aspects, motivational beliefs, and academic outcomes for Chinese students, and more research is required to shed light on the role of GM.

6. Conclusion, implications, and limitations

Based on an integrated theoretical model, the study testifies the mediation roles of metacognition, MAG, PAG, and GM in the link between reading enjoyment and reading achievement based on a Chinese sample of PISA 2018. The current research clarified how these factors work together to influence reading achievement by validating a multiple mediation model, which provides empirical data support for CVT and propositions proposed by other researchers concerning links among emotions, SRL, and academic achievement. The findings also highlight the potential benefits of positive emotion, metacognition, and motivation beliefs in learning, which might enhance students' well-being as well as academic performance.

Considering the crucial role of emotional experiences and self-regulation in learning, we suggest that teachers should incorporate Emotional Intelligence training into their course design, enhancing students' awareness and regulation of their emotions to improve their resilience toward challenging tasks. Besides, a strengths-based pedagogical approach is also advisable for teachers to guide their students to bolster positive thinking and enjoyable learning experiences. In addition, cultivating positive beliefs among Chinese students who grow up in a high-pressure educational context would also particularly enhance their academic well-being in the long run.

It is essential to bear in mind certain limitations of this study. First, as the cross-sectional study is based on self-reported questionnaires from PISA 2018, causal relationships cannot be inferred, and the results may indeed be subject to response biases. Future studies could monitor learners' emotional and cognitive fluctuations using neuroscience tools and extend their time span. It would also be desirable to employ an experimental, longitudinal design complemented by qualitative data to increase the robustness of the research and offer detailed insights into the correlations between these factors. Secondly, the task scenario and research participants are rather restricted, and the findings' generalizability to other task scenarios (like writing), learning modalities (like online learning), and students from Western nations could be further established in future research. Thirdly, the scale for growth mindset taken from the PISA 2018 data has only one item, which may lead to confusing results. Future studies could use a more sophisticated scale to measure psychological variables via more accurate methods of data analysis, such as structural equation modeling.

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