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Mastery Goal, Task Value, and Self-efficacy as Joint Predictors of Self-regulation in EFL Learning: A Conditional Process Modeling

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Abstract

This study attempted to examine the patterns of motivational factors and their interplay involved in EFL learning through the lens of self-regulated learning. 285 grade-one senior high students from three Chinese middle schools completed a questionnaire which was designed to assess motivation (mastery goal, task value, and self-efficacy) and self-regulated learning (cognitive and meta-cognitive strategy use) in classroom context. The results of conditional process modeling of the data show that mastery goal was a positive predictor of task value and self-regulated learning effort, and that task value positively mediated the relationship between mastery goal and self-regulation. In addition, the current study provided evidence that was partially against the general assumption showing that self-efficacy belief exerted a negative moderator effect on the mastery goal, task value, and self-regulated learning relation. The findings have implications for second language teaching and learning. It is suggested that due care be exercised in designing and selecting EFL learning tasks and materials so as for students to consider them as with high value in terms of interest, importance, and usefulness; educators should treat the issue of self-efficacy with subtlety to reduce the possible debilitating effects on learners.

Keywords: self-regulation, motivational belief, EFL learning, conditional process modeling

Introduction

Self-regulated learning provides a valuable perspective on academic development in research in educational psychology (Li & Lajoie, 2022), and its role in promoting foreign language learning is gaining

Data Availability Statement: *All relevant data are within this paper.*

significance. However, despite considerable improvements in our knowledge of the various factors involved in achieving language learning success, the overall pattern and interrelationships of essential factors at play in second/foreign language learning remain vague (Kim et al., 2015), such as the mechanisms through which learners harness their motivational beliefs and learning strategies (Teng & Zhang, 2018).

The unique context of learning English as a foreign language (EFL) underscores the importance of fostering self-regulated learning effort, as this learning environment could not provide sufficient input, output, or interaction opportunities for learners, making the attainment of a high level of language competence difficult. Without effective self-regulated strategies, students might not leverage opportunities that are crucial for academic learning (Kormos & Csizer, 2014).

The goal of the present study was to examine the patterns of motivational factors, and their interplay involved in EFL learning in Chinese context through the lens of self-regulated learning. Specifically, we investigated the mechanism through which learners' motivational beliefs interact with their cognitive and metacognitive behaviors in learning. Also, previous studies rarely documented how individual differences in self-belief systems may moderate the relations between motivation and self-regulation. Thus, the current study also examined how self-efficacy beliefs moderated the relation between mastery goal and self-regulation.

Literature Review

Self-regulated Learning

Self-regulation is generally believed to be a process in which people organize and manage their learning. This process consists of learners' control over their thoughts (e.g., competency beliefs), emotions (e.g., anxiety in learning), behaviors (e.g., how to complete a learning task), and the learning environment (Pintrich & DeGroot, 1990; Efklides, 2019; Zeidner & Stoeger, 2019; Zimmerman, 1998). More relevant to the present research, Zimmerman (1989) defines self-regulation as the degree to which learners are "meta-cognitively, motivationally and behaviorally active participants in their own learning process" (p. 329). Students' self-regulation of cognition in learning can have an important influence upon their achievement. Although there are different models developed from different theoretical perspectives (see Schunk & Zimmerman, 1994; Zimmerman & Schunk, 1989), most of them presume that an important dimension of self-regulated learning is the use of various cognitive and metacognitive or self-regulatory strategies to control and regulate their learning. Following the work of Weinstein and Mayer (1986), rehearsal, elaboration, and organizational strategies were recognized as major cognitive strategies associated with academic performance in the classroom (McKeachie, Pintrich, Lin & Smith, 1986; Pintrich, 1989; Pintrich & De Groot, 1990). Self-regulatory strategy referred to students' monitoring, controlling, and regulating their own cognitive strategies and actual activities. The self-regulatory strategies are believed to enhance learning by helping learners correct their studying behaviors and repair deficits in their understanding.

It is generally assumed that self-regulated learners are aware of their own aspirations and abilities, and can maximize their capabilities, dispositions, and potentials to become competent individuals. Thus, training autonomous learners who can self-regulate their learning is one of the most important trends in educational research and practice over the decades (Dent & Koenka, 2016). Researchers have shown that self-regulation plays a significant role in student learning and academic achievement (Pajares & Graham, 1999; Zimmerman & Martinez-Pons, 1988). In recent years, studies have been conducted to further substantiate the evidential link that would demonstrate the role of self-regulation in various academic settings, including second/foreign language learning (e.g., Huang, 2008, 2011; Kormos & Csizer, 2014).

Mastery Goal

The work on goal orientation "fits nicely with self-regulated learning theory" (Pintrich, 1999, p. 466) because it is believed that to self-regulate their learning, performance, and behavior, students must have some goals to compare their progress and performance. The role of different goal orientations has come into focus of research in self-regulated learning and achievement motivation. A mastery goal orientation is considered the most adaptive goal orientation for self-regulated learning (Pintrich, 1999). It refers to learning and mastering the task using self-set standards and self-improvement. When students consider self-improvement and learning as their goal, they will be prone to undertake various cognitive and metacognitive activities with a view to improving their learning and performance. Normative goal theory suggests that mastery goals orient students to a focus on learning and mastery of the content or task. They have been associated with various adaptive outcomes, such as higher levels of efficacy, task value, interest, positive affect, effort and persistence, more frequent use of cognitive and metacognitive strategies, as well as finer performance (Pintrich, 1999). Research into achievement goals in L2 contexts has consistently found positive correlations between mastery goals and learning outcomes (Wilby, 2022).

Task Value

The value of an activity plays an important part in the forethought or pre-engagement stage of self-regulated learning (Schunk & Ertmer, 2000). When students attach value to an activity, they will put more time into both planning for and doing them. Researchers have noted that task value is a triad with three important components in achievement dynamics: importance of the task, interest in the task, and utility value of the task for future goals (Eccles, 1983, 2009; Hulleman, Durik, Schweigert, & Harackiewicz, 2008). All these aspects of task value activate students' learning behaviors, for example, self-regulatory strategy use (Boscolo & Hidi, 2007). The importance component of task value is concerned with the individuals' perceptions of the task's importance or salience for them. Interest refers to the individuals' general attitudes or liking of the task that tends to stabilize over time and depends on personal inclinations. Utility value is associated with the individuals' perceptions of how useful the task is for them. Showing interest in the course works and believing them to be important and useful, learners will expend constant efforts and persistence in tasks, which tend to culminate in greater academic outcomes.

Self-efficacy

In an achievement context, self-efficacy mainly refers to students' confidence in their cognitive skills for learning or completing the course work. The efficacy theory (Bandura, 1986) and empirical findings (e.g., Woodrow, 2011) indicate that self-efficacy is a valuable resource that students can resort to when they are confronted with the difficult and demanding tasks related to academic learning and self-regulated learning. Self-efficacy was closely related to academic performance such as examinations, lab reports, papers and overall final assessment. With regard to L2 learning, Huang (2008) found that self-efficacy was "most significantly and consistently related with L2 performance" (Huang, 2008, p. 533). Dörnyei (2001) maintained that a difference in final achievement would be more likely to happen provided the type of motivation with the power to improve L2 learner engagement was available, which encompassed self-efficacy belief.

Positive relations have been established between self-efficacy and self-regulated learning in previous studies with participants from middle schools or colleges (Pintrich, 1989; Pintrich & De Groot, 1990; Pintrich & Garcia, 1991). Empirical evidence shows that self-efficacy has positive association with self-regulatory strategies including planning, monitoring, regulating, and so forth. Those students

with the belief that they can learn well and feel confident in their skills tend to report the use of various self-regulatory strategies. The L2 research has also examined the importance of L2 writers' self-regulated learning and self-efficacy drawing on theories and models from educational psychology (Teng & Zhang, 2018; Truoung & Wang, 2019).

The three types of motivational beliefs reviewed in this section, namely mastery goal orientation, task value, and self-efficacy, have been integrated, together with cognitive and meta-cognitive components of learning, into models of self-regulated learning (Garcia & Pintrich, 1994; Pintrich, 1994; Pintrich & Schrauben, 1992). These factors are directly involved in students' learning and are essential for academic attainment.

Review of related literature suggests that the various components active in self-regulated learning have been researched much more in educational psychology than in EFL learning. Also, the links between the different motivational factors are unclear and disagreement exists in the current studies regarding the directional nature of these associations (e.g., Chatzistamatiou et al., 2015; Cleary & Kitsantas, 2017; Katsantonis et al., 2023). These suggest a need for more effort to examine the dynamic interplay among these factors in EFL learning. To delve into the motivational process of EFL students' self-regulated learning, we attempted to examine how the amalgamation of some salient motivation-associated factors, specifically mastery goal, task value, and self-efficacy, affects the concerted use of cognitive learning strategies and meta-cognitive or self-regulatory strategies to control cognition. Such an approach could help elucidate the links between these variables and could be potentially helpful for EFL teaching and learning.

A Hypothetical Model of Motivational Beliefs and Self-regulation Relation

We situated the current study in the secondary EFL education in China, as English is an important subject for learning, high-stakes assessments, and future academic achievement in the context. Our focus is laid on the proximal predictors of self-regulation in language learning, specifically, mastery goal, task value and self-efficacy.

To delineate our research plan, we developed a hypothetical model (Figure 1) describing the relation between motivational factors and self-regulated learning strategies (cognitive and self-regulatory strategy use). The link connecting motivational factors and self-regulated strategies has been addressed in several theories of motivation in the field of educational psychology. In most models the motivation to achieve a specific goal is believed to induce self-regulated learning action (e.g., Heckhausen & Dweck, 1998; Lens & Vansteenkiste, 2008; Sansone & Smith, 2000; Wigfield, Hoa, & Klauda, 2008). In other words, motivational factors including the strength, relevance, and orientation of goals and positive self-related beliefs are seen as preceding the use of effective self-regulated strategies. Ryan and Deci (2000), in their extension of self-determination theory, also argue that identification with and integration of learning goals is prerequisites for self-regulated behaviors. Based on these theoretical considerations, we firstly hypothesized that the mastery goal that students pursue served as a

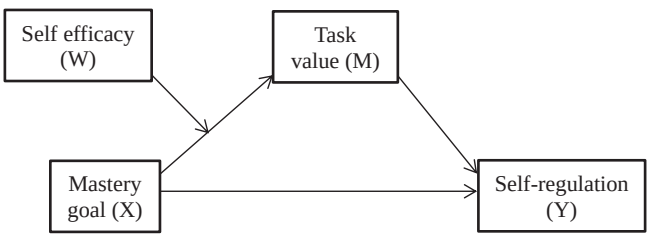

Figure 1 *Proposed moderated mediation model*.

driving force behind their task value and self-regulated learning effort. To be specific, if students set self-improvement and learning as their goal, their perception would improve for the importance and usefulness of and their personal interest in the EFL learning task. And, with the mastery goal, it will be much more likely for them to continue to participate in various cognitive and metacognitive activities to move toward that goal related to learning and self-improvement.

We also want to find out whether task value will pass the beneficial effects of mastery goal to self-regulated learning. Therefore, the second hypothesis is that task value operates as a mediator between mastery goal and self-regulation in EFL learning. Furthermore, we explore the role of self-efficacy in this mediation relation. Normative goal theory (e.g., Dweck & Leggett, 1988) suggests that self-efficacy beliefs can moderate the effects of achievement goals. Hence our third hypothesis postulates that self-efficacy positively moderates the association between mastery goal and task value. When an indirect effect of X on Y through M is moderated, we call this phenomenon moderated mediation (Hayes, 2018). Thus, we test a moderated mediation model with self-efficacy as moderator of the mastery goal, task value, and self-regulation relation. This is a conditional process model containing a mediation process ($X \rightarrow M \rightarrow Y$) combined with moderation of the $X \rightarrow M$ effect by W (Hayes, 2018).

Method

Participants

In total 285 grade-one Chinese senior high students participated in the study. They were from three middle schools located in the same city. Thus, the instructional contents and activities and the curricular design of the English course across the schools were assumed to be similar. The population represented a typical foreign language learning context in northern China. Among these participants 100 were female and 143 were male. Most of them were in the age of 16 and had been learning English for about 6 years. The participants could be considered as a convenient sample as their schools entered this research project (which was part of a larger study) on English learning for which the researcher worked. The participants' English proficiency could be considered as somewhere between CEFR (Common European Frame of Reference) A2-B1. This is because the National Matriculation English Test (NMET), a test required for college entrance in China, which will be completed by the participants 2 years later, is mostly aligned with CEFR B1 (Liu, 2018). The participants and their English teacher met three times a week, each being 100 minutes long equally divided into two sessions. The English course covered the four language skills of listening, speaking, reading, and writing. Reading, mostly focusing on grammar, dominated the class hour. As all the senior high students will take the NMET at the end of grade 3, the English course was extensively oriented toward the test. In the current study responses to the questionnaire items from 243 participants were valid.

Measures

The Motivated Strategies for Learning Questionnaire (MSLQ) for students provided the major measures for the present research. MSLQ, a self-report tool designed to assess students' motivation and self-regulated learning in classroom contexts, is one of Paul Pintrich's enduring legacies. It has proven to be a reliable and useful instrument that is widely used in self-regulation research (Patrick & Middleton, 2002) and can be adapted for different purposes for researchers, instructors, and students (Duncan & McKeachie, 2005). The MSLQ also seemed to be a "feasible pedagogical and research tool in the L2 learning context" (Huang, 2008). The *Motivational Beliefs* scale of MSLQ contains three subscales: Self-efficacy, Task value, and Test anxiety. Given the purpose of the study, the subscale Test anxiety was excluded, and a subscale devoted to mastery goal was added to the questionnaire. Please refer to the Appendix for the whole questionnaire. All items on the questionnaire were rated on 7-point

Likert scales (1 = strongly disagree to 7 = strongly agree). Items were worded to have students focus on their English classroom. For example, phrases like "in the English class" were part of the stem of the item.

Mastery Goal

The measure of mastery goal was adapted from Midgley et al.'s (2000) Patterns of Adaptive Learning Scales (PALS), which has been widely used and found to be reliable and valid with students (Jagacinski & Duda, 2001; Ross, Shannon, Salisbury-Glennon, & Guarino, 2002). The adapted Mastery Goal scale had six items related to students' perceptions that the purpose of engaging in academic work in the classroom was to develop competence. A sample item was "In the English class, really understanding the material is the main goal."

Self-efficacy

The measure of Self-efficacy (5 items) referred to students' perceptions of their competence to do their class work. Two sample items were "I can do even the hardest work in this class if I try" and "I'm certain I can figure out how to do even the most difficult work."

Task Value

The Task Value measure had 4 items that were concerned with students' personal interest in the course content and perceived utility and importance of English. A sample item was "It is important for me to learn what is being taught in this class."

Self-regulation

The Self-regulation measure addressed cognitive learning strategies and meta-cognitive or self-regulatory strategies to control cognition. The cognitive strategy scale consisted of 13 items. A sample item was "When I study I put important ideas into my own words." Self-regulatory strategy (Metacognitive strategy) scale (9 items) looked into strategies for planning, setting goals, monitoring comprehension, and regulating cognition. Sample items were "Before I begin studying I think about the things I will need to do to learn" and "I work hard to get a good grade even when I don't like a class."

Data Collection

The questionnaire items were translated into Chinese. Back-translations were employed to check the semantic and conceptual accuracy of translations. The translated items were then presented to two high school students and one English teacher to see if they had any problem or difficulty in understanding. Minor revisions were made based on their feedback. The paper-based questionnaire was administered to the participants during their normal English class hour. They were instructed to provide responses based on their perception of the English course and language learning experience. While the students were completing the questionnaire, the teacher and the researcher walked around the room to offer help should such a need arise. The teacher's presence also helped motivate the participants to be serious in providing responses to the questionnaire items.

Data Analysis

Mediation analyses were performed following the guidelines suggested by Baron and Kenny (1986) to test the hypothesis that the relationship either between mastery goal and cognitive strategy use or

between mastery goal and metacognitive strategy use is mediated by task value. To carry out this analysis, three conditions must be satisfied: (a) the independent variable mastery goal must correlate with the mediating variable task value (b) the mediating variable task value must correlate with the dependent variables self-regulation and lastly (c) the independent variable must correlate with the dependent variables. Mediation is said to be present when the effect of the independent variable on the dependent variables is either eliminated (full mediation) or weakened (partial mediation) after the mediating variable is controlled.

To investigate the hypothesis that the indirect effect (i.e. mediation) of task value on the relationship between mastery goal and self-regulation is moderated by the level of self-efficacy, we used the SPSS PROCESS macro syntax developed by (Hayes, 2018). This approach is based on multiple regression analyses and bootstrapping processes, showing that when the indirect effect (mediation) depends on the level of the moderator, then there is conditional indirect (i.e., moderated mediation) effect. In our study, we performed the analyses corresponding to Model 7 of the Hayes (2018) approach which seemed most fit for testing the relationship between the predictors and the dependent variable of the present study. According to this model (Figure 1), the moderator (i.e. self-efficacy) is assumed to affect the path from the independent variable (or antecedent[1] variable, i.e., mastery goal) to the mediator (i.e., task value). Indirect effects were estimated at different levels of the moderator to determine whether they are conditional or not (Hayes, 2018).

Results

Cronbach's Alpha, means, standard deviations, and correlations among variables are presented in Table 1. As the table shows, the Cronbach's alpha reliability coefficients for the five sub-scale in the present study were high (.789 – .914). Overall mastery goal was widely adopted by students (M = 5.353), who also reported moderately frequent use of self-regulatory and cognitive strategy in language learning (4.647 and 4.7705 respectively). Task value enjoyed the highest mean among the variables (M = 5.521), indicating that the tasks and materials used in current language teaching activities generally made language learning interesting, and students overall perceived English as very important and useful. The mean of self-efficacy belief was 5.007, suggesting that students were confident in their ability to learn or perform the course work. Correlations of variables indicated that mastery goal was positively associated with self-efficacy, task value, and self-regulatory strategy, and

Table 1 *Descriptive statistics, internal reliabilities, and bivariate correlations among the variables*

Measure	1	2	3	4	5
1. Mastery goal		.609**	.696**	.508**	.558
2. Self-efficacy			.709**	.598**	.687
3. Task value				.636**	.700
4. Self-regulatory strategy					.670
5. Cognitive strategy					
Cronbach's Alpha	.789	.859	.845	.914	.852
Mean	5.353	5.007	5.521	4.647	4.7705
SD	1.11532	1.18186	1.22752	.75648	.92482

Note: $^{**}p < .01$(two tails).

[1] Hayes (2018) stipulates "antecedent" as synonymous with "independent" variable and "consequent" as synonymous with "dependent" variable in his PROCESS macro.

cognitive strategy (r = .609, .696, .508, and .558 respectively). Self-regulatory strategy was positively correlated with self-efficacy and task value (r = .598 and .636, respectively); cognitive strategy use was also positively associated with these two variables ((r = .687 and .700, respectively). The highest correlation was between self-efficacy and task value (r = .709), while the least high was between mastery goal and self-regulator strategy (r = .508). Overall, the expected pattern of correlations was observed among the measures meeting the three conditions for mediation analysis.

Direct Effect of Mastery Goal

Table 2 exhibits the coefficients among variables, showing that mastery goal predicted task value (β = .7656, p < .001). Its direct effect on cognitive strategy was also statistically significant (effect size = .1143, 95% CI [0.0105, 0.2180]). However, the direct effect from mastery goal to self-regulatory strategy was insignificant (effect size =.0857, 95% CI [–0.0063, 0.1777]).

Mediation Analysis

To test whether task value mediates the relationship between mastery goal and self-regulated strategy use a simple mediation model was evaluated. As seen in Table 2, both mastery goal and task value accounted for 41.3 % of the variance of self-regulatory strategy. With the mediator task value entering the model, task value predicted self-regulatory strategy (β = .3379, p < .001). The path from mastery goal to self-regulatory strategy through task value was significant with the indirect effect being .2587 (95% CI [0.1908, 0.3273]). It means that the higher level of students' mastery goal, the greater task value they attach to the English class, which leads to more self-regulation of their cognitive learning. In the mediation model, there was no direct effect of mastery goal on self-regulatory strategy. However, the total effect of mastery goal on self-regulatory strategy was significant (effect size =.3444, 95% CI [0.2702, 0.4187]), indicating complete mediation.

As for the other consequent variable cognitive strategy use, as shown in Table 2, both mastery goal and task value accounted for 49.9% of the variance of cognitive strategy. Task value predicted cognitive strategy use (β = .4552, p < .001). The path from mastery goal to cognitive strategy through task value was significant with the indirect effect being .3485 (95% CI [0.2637, 0.4353]). It means that the higher level of students' mastery goal, the greater task value they attach to the English class, which leads to more cognitive learning. In the mediation model, there was still direct effect of mastery goal on cognitive strategy use. However, the total effect of mastery goal on cognitive strategy was also significant (effect size =.4627, 95% CI [0.3754, 0.5500]), which indicated that task value mediated partially the relationship between mastery goal and cognitive strategy use.

Table 2 *Model coefficients for mediation analysis*

		Consequent											
		***M* (task value)**				**Y (self-regulatory)**				**Y (cognitive)**			
Antecedent		**Coeff.**	**SE**	***p***		**Coeff.**	**SE**	***p***		**Coeff.**	**SE**	***p***	
X (mastery goal)	*a*	.7656	.0509	< .001	*c'*	.0857	.0467	.0676	*c'*	.1143	.0527	.0311	
M (task value)		–	–	–	*b*	.3379	.0424	< .001	*b*	.4552	.0479	< .001	
Constant	i_M	1.4203	.2786	< .001	i_Y	2.3227	.1931	< .001	i_Y	1.6456	.2179	< .001	
		R^2 = .4838				R^2 = .4130				R^2 = .499			
		F(1,241) = 225.9038, p < .001				F(2,240) = 84.4113, p < .001				F(2,240) = 119.9039, p < .001			

Moderated Mediation Analysis

After identifying the indirect effect of task value on the relationships between mastery goal and self-regulatory strategy, we investigated if the size of the indirect effect is moderated by self-efficacy. Results showed that self-efficacy seemed to moderate the relation between mastery goal and task value ($\beta = -.0652$, $t = -2.4960$, $p < .05$) (Table 3). More specifically, a high level of Self-efficacy decreased the effect of mastery goal on students' task value, which in turn decreased their use of Self-regulatory strategy in learning. Although the moderation of the effect of Mastery Goal by Self-efficacy (W) uniquely accounts for only 0.98% of the variance, it is statistically significant [$F(1; 239) = 6.23$, $p < .05$]. This finding suggests that self-efficacy beliefs can moderate the effects of mastery goals, with mastery goals having less effect when combined with high self-efficacy.

Looking at the model as a whole the relation ''mastery goal – task value –self-regulatory strategy'', the indirect effect was moderated as revealed as the index of moderated mediation was –.0220, with a bootstrap confidence interval from –.0378 to –.0102. Zero was not within the interval, which led to the conclusion that the indirect effect was negatively related to the moderator. That is, the mediation of the effect of mastery goal on self-regulatory strategy through task value was moderated by self-efficacy.

Although the above data analysis provided evidence of moderation, it didn't mean that "pattern is as expected or hypothesized" (Hayes, 2018, p. 411). To get a better understanding on what the interaction between mastery goal and self-efficacy meant, we generated the conditional effect of mastery goal (X) on self-regulation (Y) for various values of self-efficacy (W).

We probed the interaction between X and *M* by estimating the conditional effect of *M* at values of W corresponding to the 16th, 50th, and 84th percentiles of the distribution of W. These three values, representing low, moderate, and high on W, are found in the first column of Table 4. The second and the third columns provide the conditional effects of X on *M* (*a*) at those values of W and the effects of *M* on Y (*b*), respectively (Note that because the effect of *M* on Y is not estimated as moderated, it is constant across all values of W). The last column is the product of the second and third columns and contains the conditional indirect effect of X on Y through *M*, conditioned on the value of W in that row.

As can be seen in Table 4, the indirect effect of mastery goal on self-regulatory strategy through task value was consistently positive, but it was more positive among students relatively lower in their self-efficacy. We estimated bootstrap confidence intervals for 5,000 bootstrap samples and yielded the relevant bootstrap 95% bootstrap confidence CI's. As shown in Table 4, the conditional indirect effects were positive and did not include zero for the various values of the moderator self-efficacy, indicating the moderating effect of self-efficacy on mastery goal's indirect effect on self-regulatory strategy

Table 3 *Model coefficients for moderation analysis*

		***M* (task value)**		
Antecedent		**Coeff.**	***SE***	***p***
X (mastery goal)	a_1	.7323	.1218	<.001
W (self-efficacy)	a_2	.8119	.1458	<.001
X × W	a_3	–.0652	.0261	.0132
Constant	i_M	–.6666	.5985	.2665
		$R^2 = .6235$		
		$F(1,241) = 131.9498$, $p < .001$		

Table 4 *Conditional indirect effects of mastery goal on self-regulatory strategy through task value for various values of self-efficacy*

Self-efficacy (W)	***a* (X → *M*)**	***b* (*M* → Y)**	**X → Y**	
Value	Effect	Effect	Effect	[CI (95%)]
3.8000	.4846	.3379	.1637	[.1184 to .2190]
5.0000	.4063	.3379	.1373	[.0927 to .1899]
6.2000	.3281	.3379	.1109	[.0613 to .1665]

Table 5 *Conditional indirect effects of mastery goal on cognitive strategy use through task value for various values of self-efficacy*

Self-efficacy (W)	***a* (X → *M*)**	***b* (*M* → Y)**	**X → Y**	
Value	Effect	Effect	Effect	[CI (95%)]
3.8000	.4846	.4552	.2206	[.1631 to .2864]
5.0000	.4063	.4552	.1850	[.1288 to .2479]
6.2000	.3281	.4552	.1494	[.0851 to .2170]

through the increase of task value. So, students pursuing relatively more explicit mastery goal seemed to have higher task value in classroom activity, which translated into more self-regulatory strategy use in language learning, but more so among students who felt less efficacious about their ability to do their English task.

Similar findings were found for the ‘‘mastery goal – task value –cognitive strategy’’ relationship. The index of moderated mediation was –.0297, with a bootstrap confidence interval from –.0515 to –.0136, indicating the mediation of the effect of mastery goal on cognitive strategy use through task value was moderated by self-efficacy. Table 5 shows that the indirect effect of mastery goal on cognitive strategy use through task value was consistently positive, but it was more positive among students who reported relatively lower self-efficacy. So, students with high mastery goal also attached higher value to classroom activity, which translated into more cognitive strategy use in language learning, but more so among students who felt less efficacious about their ability to do their English tasks.

Discussion

Despite the trend that research on self-regulated learning has been on the rise (Benson, 2007), our knowledge remains limited about the self-regulated learning behavior in language learning, and a small number of studies have examined how motivational orientations influence these behaviors. The main purpose of the present research is to examine the interplay between the three proximal predictors of self-regulation, assuming a mediating role of task value and a moderating role of self-efficacy.

Hypothesis 1 Mastery Goal Promotes Task Value and Self-regulated Learning

The results provided empirical support for our first hypothesis concerning the constructive role of mastery goal. It was found that mastery goal positively impacted task value, which means that, the more mastery goal oriented the students were, the higher value they attached to the tasks in the English class. In the two mediation models with self-regulatory strategy and cognitive strategy use as

the consequent variable respectively, mastery goal was found to have positive indirect effect on the use of the two types of strategy, and positive direct effect on cognitive strategy use. These findings are in keeping with the general position and the results of previous studies that mastery goal is linked to adaptive outcomes, including higher task value, interest, positive affect, as well as the use of more cognitive and metacognitive strategies (Huang, 2012; Hulleman, Schrager, Bodmann, & Harackiewicz, 2010; Katsantonis, 2024; Lens & Vansteenkiste, 2008; Payne et al., 2007; Sansone & Smith, 2000; Wigfield, Hoa, & Klauda, 2008)， and is able to engage a number of adaptive learning variables (Reeve et al., 2012; Wilby, 2022), including effort expenditure (Jagacinski & Nicholls, 1984, 1987), preference for challenging work (Ames & Archer, 1988; Elliott & Dweck, 1988), perseverance in the face of difficulties (Elliott & Dweck), as well as intrinsic motivation for learning (Butler, 1987; Meece et al, 1988; Stipek & Kowalski, 1989). These outcomes and related variables are associated, to varying degrees, with the questionnaire items of the present research. As Pintrich (2000) rightly proposed, with mastery goals leading to task involvement, "the overall net effect would be a boost in involvement in the task with a variety of positive outcomes" (p. 545).

The finding that the direct effect of mastery goal on self-regulatory strategy was not significant in our mediation model seems to be out of keeping with previous research (e.g., Lens & Vansteenkiste, 2008; Wigfield et al., 2008). This is not entirely surprising, however, as the effect was still positive though insignificant, which was not inconsistent with the results of previous research. In addition, our Pearson correlation analysis revealed that mastery goal and self-regulatory strategy were positively associated with each other, though the association was the least strong among the values of the variables of interest (Table 1). This might partially help explain why mastery goal exerted insignificant though positive direct effect on self-regulatory strategy.

Hypothesis 2 Value Operates as a Mediator Between Mastery Goal and Self-regulation in EFL Learning

Mediation analysis revealed that task value positively predicted self-regulatory strategy and cognitive strategy in EFL students' language learning. The findings suggest that EFL students tended to use more cognitive and self-regulatory strategies in learning if they thought that the classroom activities and tasks were important, interesting, and useful for their academic achievement and future development. These results support our second hypothesis concerning the role of task value and remind us of its beneficial effects observed in previous language learning studies (Noels, Clément, & Pelletier, 2001; Noels, Pelletier, & Vallerand, 2000; Pae, 2008; Wen, 1997). They attest to the view that task value is believed to be a crucial factor mediating the effects of learners' goals and achievement-related choices and performances (Eccles & Wigfield, 2002).

The extent to which task value mediated the impacts of mastery goal on self-regulatory and cognitive strategy use turned out to be different in this study. In the case of self-regulatory strategy use, task value fully mediated the effect of mastery goal, indicating its important role in translating the effects of mastery goal into students' use of self-regulatory strategy in language learning. It seems to show that a mastery goal itself may not guarantee active employment of metacognitive or self-regulatory strategies, and that the strength of the positive association between mastery goal and self-regulation depended on the value the participants attached to the course works. In the case of cognitive strategy use, task value exerted partial mediation on the effect of mastery goal. The finding provides empirical evidence for the adaptive role that mastery goal plays in promoting increased cognitive strategy use in learning English in the classroom setting through the mediating effect of task value. Overall, the mediation analysis substantiates the positive interaction between mastery goal and task value in L2 learners' self-regulated learning (Dörnyei, 2001; Huang, 2008).

Hypothesis 3 Self-efficacy Positively Moderates the Association between Mastery Goal and Task Value

Researchers (e.g., Dweck & Leggett, 1988) have long suggested that the individual's self-efficacy may moderate the effects of achievement goals. Thus, one of the goals of this study was to investigate the moderator role of self-efficacy in the relationship between mastery goal and self-regulated learning, in our case the use of cognitive and self-regulatory strategies in EFL classroom learning. By testing the interaction of mastery goal and self-efficacy, we investigated whether the likelihood of fostering task value in classroom learning depends on the interplay between mastery goal and one's self-efficacy beliefs.

The results showed that the students' perception of themselves as being efficacious resulted in moderating the relationship of "mastery goal – task value – self-regulatory/cognitive strategy". Self-efficacy affected these paths by moderating the relationship between mastery goal and task value. The findings support our third hypothesis in terms of the moderating role of self-efficacy, but only to the negative direction of the effect. It is somewhat unexpected to see that self-efficacy negatively moderated the effects in both cases. To be specific, while students with high mastery goal also attached higher value to classroom activity, which translated into more use of cognitive and self-regulatory strategy use in language learning, but more so among students who felt less efficacious about their ability to do their English tasks. This is somewhat against the general empirical findings and theoretical beliefs that self-efficacy is mostly related to adaptive patterns of motivation, affect, cognition, and achievement (Pintrich, 1989; Pintrich & De Groot, 1990; Pintrich & Garcia, 1991). Similar moderating effect was observed by Lee, Bong, and Kim (2014). However, they found the relation between task value and maladaptive achievement strategy use depended on the level of self-efficacy. It seemed abnormal that when students were less confident about their ability to learn or perform the English course works, they would attach greater value to the classroom tasks and would be more active in using various cognitive and meta-cognitive strategies in learning to fulfill their goals of mastering the knowledge and skills required by the course. On the other hand, if students perceived their ability to achieve goals or tasks as high, they may not think the classroom tasks as valuable, interesting, or useful, hence would not extensively employ certain learning strategies to accomplish their learning goals. These findings remind us of what Bandura (1986, 1997) proposed early in his social cognitive theory that self-efficacy beliefs have a strong influence on the motivation to perform a particular action, even stronger than actual skills, knowledge, or previous accomplishment. This proposition helps explain why the participants' high self-efficacy belief exerted low impact on the 'actual skills' represented in the questionnaire items of the present research. The contradictory findings also point to the disagreement among the existing studies regarding the directional nature of the associations between motivational factors (e.g., Chatzistamatiou et al., 2015; Cleary and Kitsantas, 2017; Katsantonis et al., 2023)

Eccles and Wigfield (2002) proposed that individuals' values toward given tasks are affected by several factors, both directly and indirectly, including cultural milieu and socializers' beliefs and perceptions, as well as the individuals' expectancies for achieving the given tasks. Therefore, and alternatively, the inconsistent findings may be attributed to cultural differences. Most of the previous studies in this line of research were conducted in western context. Caution should be exercised when comparing this research body with those coming from different cultural contexts. As Pintrinch (1999) pointed out, "there may be significant cultural differences" in relation to the dynamics of motivation and self-regulation. Researchers have paid attention to the issue and have obtained findings that contradicted the western literature (e.g., King, 2016). It may be that, for this cohort of Chinese participants, being less confident about performing classroom tasks increased the motivation to learn harder and better by employing more cognitive and meta-cognitive strategies in learning. On the other hand, feeling

fully confident about completing some instructional activities produced the emotion of not wanting to expend more efforts as the tasks seemed less challenging and less interesting. Another possible reason is that Chinese students are mostly considered modest and hard working. They would not admit their confidence as they usually think that they are incompetent, and that overconfidence is often associated with arrogance. This ethos perhaps is conducive to encouraging them to put more and more efforts in learning, especially for the senior highs (Qi, 2005). Meanwhile, Chinese teachers are generally considered as the figure of authority by their students (Tsui & Ng, 2000), who tend to believe that the academic tasks designed by their teachers to be useful, important, and interesting even if they do not feel confident in performing these tasks. Given the contradictory findings concerning the motivational factors, more research ought to be done in the future that examines samples within cultures as well as across cultures to provide more insights into the dynamics involved in self-regulated learning as well as to test the generalizability of the theoretical models.

Taking the findings concerning the three hypotheses together, overall, our model showed that if mastery goal orientation was adopted, task value was likely to increase, and that task value positively mediated the relationship between mastery goal and self-regulation in learning. When students displayed a high level of self-efficacy, their task value in the classroom would decrease, which, in turn, led to decreased self-regulation in learning. That is, the effect of mastery goal on task value and self-regulated learning was contingent on the students' levels of self-efficacy beliefs.

Our findings further substantiate the general understanding that motivational beliefs have an important impact on L2 learning in the classroom context. Learners need to be motivated to use various learning strategies. The interrelationship between the motivational beliefs and learning strategies observed in the present study reminds us of the self-determination theory mentioned earlier in this article, which recognizes motivation as a fundamental component of L2 learning (e.g., Noels, Clement, & Pelletier, 1999; Pae, 2008; Wang, 2008). In large part the findings are consistent with what have been observed by several empirical studies in the field of language learning that have investigated the link connecting motivational factors, self-regulatory variables, and learner autonomy[2]. In a series of questionnaire surveys, Noels, Cléement, and Pelletier (1999, 2001) discovered a close link between students' perceived autonomy, identified regulation, and intrinsic and integrative motivation in an array of language learning contexts in Canada. Based on interview data, Ushioda (1996, 2003, 2006) also contends that learners who take responsibility for their own learning are more likely to be intrinsically motivated and can regulate their learning processes more effectively. In Hong Kong Spratt, Humphreys, and Chan (2002) conducted a study of correlational design complemented by interview data to arrive at a conclusion that the motivation to acquire an L2 triggered autonomous learning behavior.

Conclusion

This study explored the mechanism through which motivational beliefs promote and sustain self-regulated learning in Chinese EFL context. The results of the conditional process modeling provide empirical support for our first two hypotheses that the mastery goal students pursue served as a driving force behind their task value and self-regulated learning effort, and that task value positively mediated the relationship between mastery goal and self-regulation in learning. The current study provides evidence that is partially against the third hypothesis though, showing that self-efficacy belief exerted debilitating moderator effects on the mastery goal, task value, and self-regulated learning relationship.

[2] Learner autonomy in the field of language learning is broadly defined as learners' ability to exert control over learning (Holec, 1981). This definition shares an array of similarities with that of self-regulation, and some researchers in educational psychology have considered autonomous learning behavior and effective self-regulation as parallel (Kormos & Csizer, 2014).

Our research adds some helpful insights into the field of second language learning by testing and establishing an adequate and empirically supported relationship between motivational orientations and self-regulated learning behaviors. Results of our study suggest that certain types of motivational beliefs are adaptive and are helpful for enhancing and maintaining self-regulated learning, and that strong mastery goal alone may not guarantee effective use of self-regulatory learning strategies in EFL context.

These findings have important pedagogical implications. Task value plays an important role in translating the effects of mastery goal into improving self-regulated learning. Therefore, due care should be exercised in designing and selecting EFL tasks and materials so as for students to consider them as interesting, important, and useful. Of note is that students' confidence in their use of cognitive skills for learning or performing the course work may result in undesirable outcomes if not exercised appropriately. Thus, educators should treat the issue of self-efficacy with subtlety to aptly minimize its possible debilitating effects on learners' task value and use of various learning strategies. For Chinese EFL learners to thrive on confidence, teachers should encourage them to understand its positive role and associations with other motivational beliefs, based on which instructional design may be constructed to facilitate fostering self-efficacy or confidence in learning. Researchers have established that self-efficacy is not trait-like, and so a teacher is able to help a learner develop their self-efficacy over time (Johnson, Edwards, & Dai, 2014). Knowledge about these concepts should be efficiently communicated to students who should learn to understand that being confidence is as a good virtue as modesty, and so that showing confidence in class has little to do with arrogance and vanity. Note that motivational belief is a complex dynamic involving the interplay of different factors apart from the variables included here, guidance should be provided for students to efficiently manage these factors to suit their learning and cognitive styles and personality.

The use of various cognitive and self-regulatory strategies is neither spontaneous nor automatic and is by no means to be easy. It is contingent upon certain motivational factors which may effectively boost learners' performance in handling demanding academic tasks. For EFL learners to invest sufficient time and effort in self-regulated learning, they must be motivated to employ these strategies. Thus, the dynamics of motivational beliefs need to be dealt with great care and serious consideration to enhance learners' use of self-regulatory strategies and help them attain the goal of achieving a high level of language competence.

The study has several limitations that constrain the interpretation and generalizability of its findings. First, it took only a small number of motivational variables. Future studies are suggested to include more variables, given that motivational belief is a sophisticated composite that is fraught with the interaction of a variety of factors. Examination of different combination of the variables may yield more interesting and rigorous findings. Second, the research relied solely on self-report measures, which raised the question as to what extent the participants' reported activities or attributes reflected the real situation. Future studies may apply more research methods that serve the purpose of data triangulation. For example, classroom observation and teacher interview can be conducted to gain insight into the students' actual behavior activities in addition to their self-reported data. Third, the cross-sectional nature of the study precluded its potential of making causal inference based on the data. A longitudinal approach may be employed to examine the possible effects of adopting certain types of goals and values on self-regulated learning. Finally, the research only recruited participants from a single city in China, which may not sketch a full picture of the Chinese EFL learners. Recruiting participants from more diversified geographical locations are desirable for future research. Moreover, researchers may want to explore more cultural issues in this line of research in the future given the somewhat contradictory findings in terms of the role of self-efficacy beliefs made in the present study and some previous research.

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Appendix
Motivational Beliefs and Self-regulated Learning Questionnaire

Classroom Mastery Goal Structure

1. In the English class, trying hard is very important.
2. In the English class, how much you improve is really important.
3. In the English class, really understanding the material is the main goal.
4. In the English class, it's important to understand the work, not just memorize it.
5. In the English class, learning new ideas and concepts is very important.
6. In the English class, it's OK to make mistakes as long as you are learning.

Self-efficacy

7. I'm certain I can understand the ideas taught in the English course.
8. I expect to do very well in the English class.
9. I am sure I can do an excellent job on the problems and tasks assigned for the English class.
10. I think I will receive a good grade in the English class.
11. I know that I will be able to learn the material for the English class.

Task Value

12. It is important for me to learn what is being taught in the English class.
13. I like what I am learning in the English class.
14. I think that what I am learning in the English class is useful for me to know.
15. I think that what we are learning in the English class is interesting.

Cognitive Strategy Use

16. When I study for a test, I try to put together the information from class and from the book.
17. When I do homework, I try to remember what the teacher said in class so I can answer the questions correctly.
18. It is hard for me to decide what the main ideas are in what I read.
19. When I study I put important ideas into my own words.
20. I always try to understand what the teacher is saying even if it doesn't make sense.
21. When I study for a test I try to remember as many facts as I can.
22. When studying, I copy my notes over to help me remember material.
23. When I study for a test I practice saying the important facts over and over to myself.
24. I use what I have learned from old homework assignments and the textbook to do new assignments.
25. When I am studying a topic, I try to make everything fit together.
26. When I read material for the English class, I say the words over and over to myself to help me remember.
27. I outline the chapters in my book to help me study.
28. When reading I try to connect the things I am reading about with what I already know.

Self-regulatory Strategy Use

29. I ask myself questions to make sure I know the material I have been studying.
30. When work is hard I either give up or study only the easy parts.
31. I work on practice exercises and answer end of chapter questions even when I don't have to.

32. Even when study materials are dull and uninteresting, I keep working until I finish.
33. Before I begin studying I think about the things I will need to do to learn.
34. I often find that I have been reading for class but don't know what it is all about.
35. I find that when the teacher is talking I think of other things and don't really listen to what is being said.
36. When I'm reading I stop once in a while and go over what I have read.
37. I work hard to get a good grade even when I don't like a class.