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Empirical Study of L2 Motivation and Motivational Learning Behaviors among College Students in English for Medicine Class

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Abstract:

This study examines the relationship between L2 motivation and motivational learning behaviors among college students enrolled in an English for Medicine course at a university in Zhejiang, China. It aims to help language teachers gain a deeper understanding of the relationship among constructs in the L2 Motivational Self System and how constructs like the Ideal L2 Self, Ought-to L2 Self, and Second Language Learning Experience influence students' motivational learning behaviors using the L2 Motivational Self System framework. Eighty medical students were included as a sample, and a structured questionnaire was used to gather the quantitative data. Through a quantitative analysis, it is found that the students' motivational learning behaviors are significantly predicted by both L2 motivation and Second Language Learning Experience, with a moderate influence from the Ideal L2 Self. Additionally, the Ought-to L2 Self had less impact on the students' learning behaviors. The findings show that fostering intrinsic motivation and providing a supportive learning environment is necessary to improve students' engagement and effort in English for medicine courses.

Keywords: English for medicine, ideal second language self, second language learning experience, motivation, motivational learning behavior, ought-to second language self
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Introduction

English has become the lingua franca globally across various professional fields, including medicine. The demand for proficiency in English, particularly in English for Specific Purposes (ESP), such as English for medicine, has heightened, especially in non-native English-speaking countries. In China, the drive for educational reforms has strongly emphasized enhancing English language proficiency among college students, particularly those in specialized fields like medicine (Yu & Liu, 2018; Chen, 2024). The emphasis on English for medicine reflects academic needs and responds to the increasing requirements for medical professionals to engage with international research, clinical practices, and communication (Li & Wang, 2024; Zhang, 2024).

In the medical field, English is growing in importance, and students often face challenges in achieving proficiency, which may be influenced by their motivation and motivational behaviors to learn the language. The L2 Motivational Self System (L2MSS), proposed by Dörnyei (2005, 2009), provides a comprehensive framework to understand the motivational dynamics of second language acquisition. This model, which includes components such as the Ideal L2 Self (IL2S), the Ought-to L2 Self (OL2S), and the Second Language Learning Experience (SLLE), has been widely studied across various contexts.

When examining the predictors of success in medical English courses, it is essential to consider how these motivational factors interact with traditional measures of language proficiency, such as college entrance English scores. The present study explores the relationship between L2 motivation and motivational learning behaviors among college students enrolled in an English for medicine course at a university in Zhejiang, China. Specifically, it aims to examine how different components of the L2MSS--namely, the Ideal L2 Self (IL2S), the Ought-to L2 Self (OL2S), and the Second Language Learning Experience (SLLE) relate to students' Motivational Learning Behaviors (MLB). The study also investigates the influence of college entrance English scores as a potential predictor of these behaviors. The significance of this study lies in two aspects: it contributes to the theoretical understanding of L2MSS by exploring its components within the English for medicine classroom in China, extending the application of L2MSS to a specific educational and cultural setting. Pedagogically, this study offers guidelines for the teachers to make the best use of the specific motivational factors related to learners' performance to arouse, enhance, and maintain students' motivation in learning English by creating teaching activities to foster intrinsic motivation and a positive learning environment. Therefore, the research objectives of this study are:

(1) To investigate the relationships between college entrance English scores, L2 motivation, IL2S, OL2S, SLLE, and MLB of medical students in the medical English course.

(2) To determine how IL2S, OL2S and SLLE influences the motivational learning behaviors of these students respectively.

(3) To identify the strongest predictors of MLB among medical students in medical English courses, considering college English entrance scores, L2 motivation, IL2S, OL2S, and SLLE.

To achieve these research objectives, the study poses five research questions:

(1) What is the relationship between college entrance English scores, L2 motivation, IL2S, OL2S, SLLE, and MLB of students in the medical English course?

(2) How does the Ideal L2 Self impact motivational learning behavior among these students?

(3) How does the Ought-to L2 Self impact their motivational learning behavior?

(4) How does the Second Language Learning Experience influence their motivational learning

behavior?

(5) What are the strongest predictors of motivational learning behavior in medical English courses among medical students, considering college English entrance scores, L2 motivation, IL2S, OL2S, and SLLE?

This paper first reviews studies on language motivation, motivational learning behaviors, and motivational learning behaviors in English for Medicine Classrooms. Next, it elaborates on the research methodology employed in the study. The research results, discussion, and conclusion are presented in later sections.

Literature Review

Language Motivation

The study of L2 motivation, particularly within English for Specific Purposes (ESP), has been extensively studied in recent years, with the focus mainly on understanding how different motivational components would impact language learning outcomes. One of the central frameworks used in this area is Dörnyei's (2005) L2 Motivational Self System, which includes the Ideal L2 Self, the Ought-to L2 Self, and the Second Language Learning Experience as key elements influencing language learning behavior and language achievements. The Ideal L2 Self represents the learner's aspirations and desires to become proficient in the target language, which strongly predicts motivated learning behaviors in western and Chinese contexts (Csizér & Kormos, 2009; Liu, 2013; Liu & Zhang, 2013; Papi &Teimouri, 2012, 2014; Papi & Abdollahzadeh, 2011; Papi et al., 2018; Takahashi & Im, 2020). Dogomeo (2023) illustrated that learners who maintain a clear vision of their Ideal L2 Self are more likely to sustain their motivation throughout their language-learning journey. This element is particularly relevant in medical English as students often link language proficiency to their future profession, motivating them to succeed.

On the other hand, the Ought-to Self, which represents the perceived external pressures and expectations from society or significant others, also plays a critical role in shaping one's motivation. Although the Ought-to Self can motivate learners, its impact on learning behaviors is often distinct from that of the Ideal L2 Self. Research suggests that while the Ideal L2 Self tends to foster positive and proactive learning behaviors, the Ought-to Self may result in a more avoidance-oriented motivation, where learners engage in tasks primarily to avoid failure rather than to achieve success (Taguchi et al., 2009; Yue et al., 2022; Dörnyei & Chan, 2013; Kamaruddin et al., 2017).

Besides personal factors, the Second Language Learning Experience (SLLE) also plays a vital role in influencing motivation. This SLLE encompasses the social, academic, and institutional settings where language learning occurs. "Motivation is responsible for why people decide to do something, how long they are willing to sustain the activity, and how hard they are going to pursue it." This quote by Dörnyei and Skehan (2003) emphasized the critical role of motivation in language learning, indicating that a positive SLLE can significantly enhance learners' commitment and effort in mastering a second language. Studies have shown that when learners view that they were in a supportive and favorable environment for learning, they are more willing to display motivated learning behaviors and achieve better language outcomes (Henry, 2014). Similarly, the classroom setting is vital in molding students' motivation. Research emphasizes that fostering a positive and interactive classroom atmosphere can significantly boost students' participation and motivation (Yang, S, 2023; Vibulphol, 2016).

Recent developments in the study of second language motivation in China reflect an

increasing focus on the complex dynamics that influence learners' motivation across different educational contexts. A significant trend is the exploration of intrinsic and extrinsic motivation, with studies indicating that intrinsic motivation, characterized by self-directed learning and engagement, leads to higher proficiency levels than extrinsic motivation, which is often linked to external rewards or pressures (Manipol, 2024). This aligns with findings highlighting the importance of fostering a supportive learning environment that enhances Chinese students' intrinsic motivation, thereby improving their language acquisition outcomes (Jiao et al., 2022; Erniyati &Putra, 2015; Li, 2023; Zhu, 2023). Moreover, the role of the classroom environment has emerged as a critical factor in motivating learners. Research suggests that interactive teaching methods and a positive classroom atmosphere can significantly enhance students' motivation to learn a second language (Yang, 2023).

Motivational Learning Behaviors

Motivational learning behaviors in English classrooms, mainly through the lens of the L2 Motivational Self System (L2MSS) theory, emphasize the interplay between learners' self-perceptions, goals, and the learning environment. L2MSS posits that the ideal self, the ought-to self, and the learning experience influence motivation, collectively shaping learners' engagement and persistence in language learning.

The psychosocial environment of the classroom significantly impacts students' motivation and commitment to learning English. Gelete (2023), Nottingham and Henning (2014), and Iraj et al. (2021) all highlighted that a supportive classroom atmosphere and favorable feedback enhance students' motivation because the learning process predominantly occurs within this context. Integrating enjoyable and engaging teaching methods, such as flipped classrooms and communicative teaching activities, has further enhanced learners' motivation and academic performance in the Chinese context (Ying & Ayub, 2022).

Moreover, teachers' application of motivational strategies plays a vital role in shaping students' learning behaviors. Zhang (2023), as well as Yang and Wyatt (2021), emphasized that motivational techniques not only make the classroom more engaging but also facilitate effective teaching and learning. Similarly, using transformational leadership in classrooms, as noted by Ying and Ayub (2022), can stimulate students' interest and set motivational goals, thereby enhancing their engagement.

In addition to the classroom environment and teaching strategies, the role of learner autonomy and external factors cannot be overlooked. Soviyah's (2022) study indicated that while students may exhibit a high level of autonomy in their learning, their engagement in outside-classroom activities remains moderate. This study suggests that fostering a sense of responsibility in learners is essential for enhancing their motivation.

Motivational Learning Behaviors in English for Medicine Classroom

Motivational learning behaviors are crucial in the medical English classroom. Alzabidi and Khadawardi (2022) and Sak (2020) found that the IL2S significantly affects students' willingness to communicate (WTC) in speaking classes, indicating that when students visualize themselves as competent speakers in their specific fields. Studies in China have shown that students who possess a strong Ideal L2 Self are more likely to engage in proactive learning behaviors and demonstrate higher levels of motivation (Wang, 2023). This study also aligns with findings that highlight the instrumental motivations of Chinese medical students, who often regard good English proficiency

as an important indicator of their career development and international collaboration (Wisnuwardhani, 2022). As for OL2S, in the context of medical education in China, these pressures often derive from academic requirements, social expectations, and the competitive nature of the medical field (Mayers, 2023). Research indicates that students who perceive strong external expectations are motivated to learn English, although this motivation may not be as robust as that driven by intrinsic aspirations (Metakides, 2023; Ahmadishokouh, 2024).

Additionally, the quality of the Second Language Learning Experience (SLLE) plays a critical role; positive and engaging learning experiences significantly enhance students' commitment to learning (Dewaele, 2020; Dörnyei & Ryan, 2015). Effective teaching methodologies, such as interactive and student-centered approaches, have been shown to enhance students' motivation by creating engaging and supportive learning environments (Dai, 2023; Wang & Liu, 2023).

In summary, although the L2 Motivational Self System (L2MSS) has been widely studied in general English and ESP contexts, research specifically addressing its application in medical English classrooms is rare. There remains a significant gap in the literature regarding how these motivational factors influence students' learning behaviors in ESP contexts, particularly in English for medicine courses in China (Xu et al., 2024; Hotak et al., 2024). Besides, though motivational factors such as L2 motivation, IL2S, OL2S, and SLLE are recognized as significant, their relative predictive power in explaining motivational learning behaviors among medical students has not been adequately explored. A quantitative analysis is needed to identify the strongest predictors within these students in English for medicine class.

Method

In order to answer the research questions above, the present study adopted a quantitative approach. The setting was a local university in Zhejiang province of China, which has implemented English for medicine classes for first-year and second-year medical students. This course is conclusory for medical students, and it is a bridge course connecting general college English to academic medical English. In this class, the instructor mainly adopted a communication-oriented teaching approach and motivational strategies to ensure the students are highly involved in the classroom. Meanwhile, students have a wide range of English exposure opportunities, such as talks, seminars, TV shows, video clips, and radio.

Participants

A purposeful sampling technique was employed to select the participants in this study. Purposeful sampling allows researchers to select participants most likely to provide rich, relevant, and diverse data regarding the research questions under investigation (Patton, 2015). This sampling method enabled us to specifically target students enrolled in the English for Medicine course, ensuring that the participants had direct experience with the specific language learning context under investigation. Given that our research aims to delve deeply into the motivational dynamics within this unique group, it was crucial to select participants who could provide insights that are directly relevant to the study's objectives (Creswell & Plano Clark, 2017).

In total, 80 students attending medical English classes in the 2023 fall and 2024 spring were included. The majority are female (67, 83.75%), with 13 (16.25%) being male. Most participants are in their second year (59, 73.75%), while 26.25% (21) are in their first year. They all ranged between 18 and 20 years of age, majoring in medicine, nursery, and pharmaceutics in

medical school. They were given classes by the same lecturers using the same teaching materials and aids. Everyone has finished the prerequisite general college English course and met the entrance level of English for medicine class.

Research Instruments

The instrument used in this study is Questionnaire of L2M and Motivational Learning Behaviors (Appendix A). It consists of two parts: the first part is the personal information of participants, including gender, college entrance English score, academic levels or majors, or language proficiency. Part II is the Likert items to identify (1) L2 Motivation(L2M), (2) Ideal L2 Self (IL2S), (3) Ought to L2 Self (OL2S), (4) Second Language Learning Experience (SLLE), which were adapted from items made by Taguchi et al. (2009) and also from questionnaires made by other researchers, including Ryan (2009), Yashima (2009), and Qin and Wen (2002). Moreover, some items are to identify (5) L2 Motivational Learning Behaviors, which were adapted from Papi's (2010) and Al-Shehri's (2009) studies to measure L2 learners' motivational learning behaviors. All items were measured using a six-point Likert scale, ranging from disagree strongly (1) to agree strongly (6). The six-point Likert scale did not include the response uncertain to prevent neutral results.

In total, there are 43 items in this questionnaire, as shown in Table One.

Table One. *Subscales of questionnaire*

No.	Subscale	Number of Items
1	L2M	6
2	IL2S	7
3	OL2S	6
4	SLLE	5
5	Motivational Learning Behavior (MLB)	19
Total		43

The reliability of the whole questionnaire was tested and is shown in Table Two. Cronbach's Alpha value of 0.943 indicates a high level of internal consistency for the 43 items included in the scale. The results confirm the reliability of the data, supporting the robustness of the subsequent analysis in exploring the constructs related to L2 motivation and learning behaviors among the participants.

Table Two. *Reliability statistics*

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of Items
.943	.945	43

Research Procedures

Questionnaires about students' L2 motivation and L2 motivational learning behaviors were distributed to 80 students through the online platform *Wenjuanxing.com*. In total, the data of 74

respondents were analyzed quantitatively using SPSS 23.0, with six excluded. Some statistical analysis methods were adopted here: 1) descriptive statistical analysis to describe the general situation of students' L2 motivational self-system; 2) Pearson's correlation analysis to figure out whether there is a correlation relationship between L2M and the components of L2MSS, motivational learning behavior; 3) the liner regression analysis to examine the how significant the influence of IL2S, OL2S, and SLLE on learning behaviors in medical English class. 4) The multiple regression analysis examines which component best predicts students' motivational learning behavior. Finally, the interpretation of the results was conducted.

Results

The results of the data analysis concern five parts:

Correlation among Correlation Matrix

The correlation between college entrance English score, L2M (L2 Motivation), IL2S (Ideal L2 Self), OL2S (Ought-to L2 Self), SLLE (Second Language Learning Experience), and MLB (Motivational Learning Behavior) was analyzed using SPSS 23.0. Table Three presents a correlation matrix among them:

Table Three. *Correlation between college entrance English score, L2M, IL2S, OL2S, SLLE, and MLB*

		College Entrance English Score	L2M	IL2S	OL2S	SLLE	MLB
College Entrance English Score	Pearson Correlation	1					
	Sig.(two-tailed)						
	N	74					
L2M	Pearson Correlation	.281*	1				
	Sig.(two-tailed)	.015					
	N	74	74				
IL2S	Pearson Correlation	.255*	.569**	1			
	Sig.(two-tailed)	.028	.000				
	N	74	74	74			
OL2S	Pearson Correlation	.150	.327**	.359**	1		
	Sig.(two-tailed)	.203	.004	.002			
	N	74	74	74	74		
SLLE	Pearson Correlation	.085	.663**	.457**	.372**	1	
	Sig.(two-tailed)	.473	.000	.000	.001		
	N	74	74	74	74	74	
MLB	Pearson Correlation	.224	.738**	.552**	.210	.666**	1
	Sig.(two-tailed)	.055	.000	.000	.072	.000	
	N	74	74	74	74	74	74

*. Correlation is significant at the 0.05 level (two-tailed).
**. Correlation is significant at the 0.01 level (two-tailed).

College Entrance College Entrance English Score has a positive correlation with L2M (r = 0.281, p < 0.05) and IL2S (r = 0.255, p < 0.05). This indicates that students who scored higher on their college entrance English exam tend to have higher motivation to learn English and are more likely to have a strong Ideal L2 Self. There is no significant correlation with OL2S, SLLE, and MLB, showing that the college entrance English score does not show a significant relationship with these variables, indicating that prior academic achievement in English does not strongly predict motivational learning behaviors or other motivational constructs.

For the L2M and IL2S, the correlation coefficient is r =0.569, p < 0.01, indicating a strong positive and statistically significant relationship between L2M and IL2S. The correlation coefficient is 0.327, with a significance level of 0.004. A moderate positive and statistically significant relationship exists between L2M and OL2S (r= 0.327, p<0.01). There is a strong positive and statistically significant relationship between L2M and SLLE (r= 0.663, p<0.01). The correlation coefficient between L2M and MLB is 0.738, with a significance level of 0.000, indicating a very strong positive and statistically significant relationship between L2M and MLB.

Concerning IL2S, the correlation coefficient between IL2S and OL2S is 0.359, with a significance level of 0.002, indicating a moderate positive and statistically significant relationship between IL2S and OL2S. The correlation coefficient between IL2S, SLLE, and MLB is 0.457 and 0.552, respectively, with a significance level of 0.000, indicating a strong positive and statistically significant relationship between IL2S, SLLE, and MLB.

The correlation coefficient between OL2S and SLLE is 0.372, with a significance level of 0.001, indicating a moderate positive and statistically significant relationship between OL2S and SLLE. The correlation coefficient between OL2S and MLB is 0.210, with a significance level of 0.072, indicating a weak positive relationship between OL2S and MLB, but it is not statistically significant at the 0.01 level.

Finally, the correlation coefficient between SLLE and MLB is 0.666, with a significance level of 0.000, indicating a very strong positive and statistically significant relationship between them.

Significant Impact of Idel L2 Self on Motivational Learning Behavior

Table Four. *Regression model summary of IL2S and MLB*

		Unstandardized coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	2.636	.282		9.359	.000		
	IL2S	.370	.066	.552	5.622	.000	1.000	1.000
Dependent Variable: MLB R=.552 , R^2 =0.305, Adjusted R^2 =0.295, F（1，72）=31.605, Sig.=.000, Durbin-Watson= 1.707								

Table Four shows that the simple linear regression analysis further substantiated the relationship between IL2S and MLB. The regression model is statistically significant (F (1, 72) = 31.605, p < 0.001), explaining 30.5% of the variance in MLB (R^2 = 0.305). The adjusted R^2 value of 0.295 suggests that the model remains robust even after accounting for the sample size and number of predictors.

In Table Four, the unstandardized regression coefficient for IL2S was 0.370 (β= 0.552, t = 5.622, p < 0.001), indicating that for every one-unit increase in IL2S, there is a corresponding

0.370-unit increase in MLB. This significant positive relationship highlights the critical role of the Ideal L2 Self in motivating students to engage in both in-class and out-of-class learning activities. The constant term in the regression model (B = 2.636, $p < 0.001$) represents the baseline level of MLB when IL2S is absent, providing further context for understanding the magnitude of IL2S's impact.

The absence of multicollinearity, as indicated by the Tolerance and VIF values (equal to 1.000), reinforces the reliability of the regression model. Additionally, the Durbin-Watson statistic (1.707) suggests that the model's residuals are free from significant autocorrelation, ensuring the validity of the results. The results indicate that IL2S significantly positively impacts students' motivational learning behaviors in English for medicine class.

Significant Impact of Ought-to L2 Self on Motivational Learning Behavior

Table Five. *Regression model summary of OL2S and MLB*

		Unstandardized coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	3.612	.321		11.248	.000		
	OL2S	.163	.089	.210	1.825	.072	1.000	1.000
Dependent Variable: MLB R= .210 , R^2 =0.044, Adjusted R^2 =0.031, F（1，72）=3.332, Sig.=.072, Durbin-Watson= 1.928								

As indicated above in Table Three, the relationship between OL2S and MLB is modest but statistically significant. However, the magnitude of the relationship is relatively weak, indicating that OL2S might not be the primary driver of motivational learning behavior in this context.

A simple linear regression analysis was conducted further to assess the predictive power of OL2S on MLB. The model summary (Table Five) indicates that OL2S accounts for only 4.4% of the variance in MLB ($R^2 = 0.044$), with an adjusted R^2 of 0.031. This suggests that while OL2S has a statistically detectable impact on MLB, the effect is relatively small, and the majority of the variance in MLB is explained by factors other than OL2S.

Table Five shows that the regression model was not statistically significant at the conventional 0.05 level (F (1, 72) = 3.332, p = 0.072), though it approached significance. The standardized regression coefficient (β = 0.210) indicates that OL2S has a positive, albeit weak, effect on MLB. The unstandardized coefficient (B = 0.163) suggests that for every one-unit increase in OL2S, there is an associated 0.163-unit increase in MLB. However, given the p-value of 0.072, this effect is marginal and warrants cautious interpretation. The findings suggest that the Ought-to L2 Self, which reflects the perceived external expectations or obligations to learn English, is limited in influencing students' commitment to learning English for medical purposes.

Significant Impact of the Second Language Learning Experience on Motivational Learning Behavior

Table Six. *Regression model summary of SLLE and MLB*

		Unstandardized coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	2.091	.281		7.438	.000		
	SLLE	.486	.064	.666	7.581	.000	1.000	1.000

Dependent Variable: MLB R= .666 , R^2 =0.444, Adjusted R^2 =0.436, F（1，72）=57.468, Sig.=.000, Durbin-Watson= 1.901

As indicated in Table Three above, a correlation analysis demonstrated a significant positive relationship between SLLE and MLB (r = 0.666, p < 0.001). This strong correlation suggests that students who report more positive second language learning experiences are also more likely to exhibit higher levels of motivational learning behavior.

The simple linear regression analysis further explored the predictive power of SLLE on MLB. The model summary (Table Six) shows that SLLE explains 44.4% of the variance in MLB (R^2 = 0.444), with an adjusted R^2 of 0.436, indicating that a substantial proportion of the variance in MLB is attributable to SLLE. The model was statistically significant (F (1, 72) = 57.468, p < 0.001), confirming that SLLE is a significant predictor of MLB.

As shown in Table Six, the unstandardized regression coefficient for SLLE was 0.486 (β =0.666, t = 7.581, p < 0.001), indicating that for every one-unit increase in SLLE, there is a corresponding 0.486-unit increase in MLB. The positive coefficient reinforces that favorable second language learning experiences are strongly linked with the improvement of motivational learning behavior. The constant term (B = 2.091, p < 0.001) represents the baseline level of MLB when SLLE is zero, providing context for understanding the magnitude of SLLE's impact.

The absence of multicollinearity, as evidenced by the Tolerance and VIF values (equal to 1.000), further confirms the reliability of the regression model. Additionally, the Durbin-Watson statistic (1.901) suggests that the model's residuals are free from significant autocorrelation, supporting the validity of the findings.

The Predication Power of Various Constructs

Table Seven. *Regression model summary of various constructs*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
	(Constant)	1.303	.509		2.558	.013		
	L2M	.350	.087	.443	4.035	.000	.446	2.240
	IL2S	.123	.062	.184	1.985	.051	.629	1.591
	OL2S	-.102	.063	-.131	-1.611	.112	.812	1.232
	SLLE	.244	.075	.334	3.258	.002	.514	1.945
	College Entrance English Score	.002	.004	.044	.564	.575	.880	1.137
Dependent Variable: MLB R=.796 , R^2 =0.633, Adjusted R^2 =0.607, F=23.504***,								
*** Correlation is significant at the 0.001 level (2-tailed)								

Based on the multiple regression analysis provided, here is an interpretation of the results. As shown in Table Seven, the R-squared value is 0.633, indicating that approximately 63.3% of the variance in MLB is explained by the independent variables (L2M, IL2S, OL2S, SLLE, and College Entrance English Score). The adjusted R^2 is 0.607, which accounts for the number of predictors in the model showing a good fit. The F-statistic is 23.504 with a significance level of 0.000, indicating that the model is statistically significant as a whole.

As for the regression coefficients, as shown in Table Seven, L2M (β = 0.443, p < 0.001) has a significant positive effect on MLB. This suggests that an increase in L2 Motivation is

strongly associated with an increase in Motivational Learning Behavior. As for IL2S (β = 0.184, p = .051), it has a marginally significant positive effect on MLB. This indicates that the Ideal L2 Self might positively impact Motivational Learning Behavior, although it is close to the threshold for significance. OL2S (β = -0.131, p = 0.112) does not statistically affect MLB. It has a negative coefficient, suggesting that Ought-to L2 Self may not be a strong predictor of Motivational Learning Behavior in this context. SLLE (β = 0.334, p = 0.002) significantly affects MLB, indicating that a positive Second Language Learning Experience significantly boosts Motivational Learning Behavior. The effect of College Entrance English Score (β = 0.044, p = 0.575) on MLB is insignificant, suggesting that past English performance does not significantly influence current motivational learning behavior.

Moreover, the predictors' VIF values are all below 10, indicating that multicollinearity is not a concern in this model. In all, the regression equation is:

*Motivational Learning Behavior (MLB)=1.303+0.350*L2M+0.123*IL2S-0.102*OL2S+0.244*SLLE+0.002*College Entrance English Score*

To summarize, L2M and SLLE are the most significant predictors of Motivational Learning Behavior. This suggests that students with a strong L2 motivational self and positive learning experiences are more likely to engage in behaviors that support their learning goals. IL2S, while not as strong, still has a marginally significant favorable influence on MLB, implying that having a clear and motivating ideal self-concept in language learning might contribute to motivated behavior. OL2S does not significantly predict MLB, suggesting that external obligations or expectations might not be a strong motivator for learning behavior among these students. College Entrance English Score does not significantly influence current Motivational Learning Behavior, indicating that past performance/success/failure in English is not necessarily a determining factor of current motivation.

Discussion

The relationship between L2M, IL2S, OL2S, SLLE, and motivational learning behaviors was presented using a survey and data analysis of the research data. This section will present further discussions by referring to relevant studies based on the five research questions.

RQ1: What is the relationship between college entrance English scores, L2 motivation, IL2S, OL2S, SLLE, and motivational learning behavior of students in the medical English course?

The results indicate the strong correlations of L2M and SLLE with MLB, suggesting that both a robust L2 Motivational Self System and positive language learning experiences are critical drivers of motivational learning behaviors in this context. The IL2S is moderately correlated with motivational behavior, indicating its importance but suggesting that it may not be as critical as L2M and SLLE in this sample. Moreover, the limited impact of OL2S can be noted. The weaker and non-significant correlation of OL2S with MLB suggests that external pressures or obligations play a less significant role in motivating students than internal motivations and experiences.

The findings regarding the strong correlations between the L2M and SLLE with MLB highlight the importance of intrinsic factors in language learning. The L2MSS framework, in particular, suggests that learners' motivation is deeply related to their self-perceptions and experiences in language learning. This highlights the need for educational surroundings to foster students' intrinsic curiosity and interests, as doing so can significantly enhance their motivation to learn English (Jiao et al., 2022). This perspective aligns with Erniyati and Putra's assertion that

personal goals, interests, and self-efficacy are key drivers of student motivation. Their work reinforces that internal motivations are more powerful than external pressures in promoting effective language learning (Erniyati & Putra, 2022).

Moreover, the moderate correlation of the IL2S with motivational behavior indicates its relevance but also suggests that it may not be as critical as L2M and SLLE. Papi and Teimouri (2012) highlight that strong attitudes to the IL2S can significantly predict motivation. However, they also note that this self-image must be supplemented by positive learning experiences to engage learners fully. Thus, in this study, it could be found that while the Ideal L2 Self plays a role in medical English class, the combination of self-perception and experiential factors drives motivation more robustly.

The limited impact of the OL2S is particularly significant. The weaker and non-significant correlation of OL2S with MLB suggests that external pressures or obligations are less effective in motivating students than intrinsic motivations and positive experiences. This finding echoes the work of Dörnyei and Chan (2013), who argued that motivation is more effectively fostered through personal relevance and internalized goals rather than external expectations. This perspective is also echoed by Kamaruddin et al. (2017), who identified intrinsic motivation as a significant factor influencing language learning, further supporting the notion that internal drives are more influential than external obligations.

These findings highlight the importance of developing strong internal motivation and cultivating supportive learning settings to increase students' effort and participation in medical English classes.

RQ2: How does the Ideal L2 Self impact motivational learning behavior among these students?

The substantial variance IL2S accounts for in MLB indicates that students' visions of themselves as proficient English-speaking professionals significantly influence their motivation to learn. This aligns with the research by Papi et al. (2018), which emphasizes that the IL2S serves as a powerful motivator, driving learners to engage in behaviors that align with their aspirations. Furthermore, Kamaruddin et al. (2017) found that learners often prioritize their IL2S over external expectations, suggesting that intrinsic motivations rooted in personal aspirations are more impactful than social pressures.

To effectively cultivate this Ideal L2 Self, educators and curriculum designers should implement targeted strategies that encourage students to visualize their future professional identities. Techniques such as goal-setting activities, which have been shown to enhance motivation and academic performance (Orzechowska & Polok, 2019), can be particularly beneficial. Goal-setting helps students clarify their aspirations and fosters a sense of ownership over their learning process. The results of Takahashi and Im (2020) supported this statement, who observed a positive correlation between recognized regulation (connected to the IL2S) and language competency. They argued that when students set clear personal objectives, their motivation and subsequent language learning achievement improve.

Moreover, incorporating visualizations of future professional scenarios can further strengthen students' Ideal L2 Self. The results from this study echoed Dogomeo's (2023) study, which claimed that maintaining a clear vision of their Ideal L2 Self is more likely to sustain their motivation throughout their language-learning journey. This approach can be complemented by reflective practices that encourage students to consider the role of English in their medical careers.

Their comprehension of the value of language proficiency for their future careers may grow due to these reflections, increasing their incentive to participate in worthwhile learning activities.

In summary, by focusing on strategies that enhance the Ideal L2 Self, educators can significantly impact students' motivation and engagement in English language learning. This aligns with the broader literature on L2 motivation, consistently highlighting the importance of intrinsic factors and self-perception in driving successful language acquisition (Papi & Teimouri, 2012, 2014; Papi et al., 2018). Strengthening the Ideal L2 Self not only fosters motivation within the classroom but also equips students with the necessary skills and mindset to continue their language learning beyond formal education settings.

RQ3: How does the Ought-to L2 Self impact their motivational learning behavior?

The Ought-to L2 Self (OL2S) exerts a modest influence on motivational learning behavior among medical students studying English, as evidenced by various studies that explore the dynamics of language learning motivation. While external expectations associated with the OL2S can contribute to students' commitment to learning, the effect is limited compared to other motivational constructs, particularly the Ideal L2 Self (IL2S). This distinction is crucial, as it highlights the varying degrees of influence that different components of the L2 Motivational Self System (L2MSS) have on learners' engagement and persistence in language learning. Research indicates that while the OL2S, which encompasses the pressures and expectations from others (such as family, teachers, or society), can motivate students to some extent, it often lacks the depth and sustainability of motivation derived from the IL2S. For instance, Takahashi and Im (2020) found that the relationship between OL2S and motivated learning behavior is weaker than that of IL2S, which is more closely linked to intrinsic motivation and personal aspirations.

Moreover, studies have shown that the IL2S is a stronger predictor of language learning outcomes than the OL2S, echoing this study's findings. For example, Alzabidi and Khadawardi (2022) emphasized that the IL2S not only arouses interest but also sustains it as students invest time and effort to achieve their language learning goals. This aligns with the findings of Bóbkina et al. (2021), who reported that higher levels of motivation associated with the IL2S corresponded to more excellent proficiency in the language, while the OL2S was more prevalent among students with lower proficiency and limited learning experiences. Such evidence suggests that while external pressures can motivate students, they do not foster the same level of commitment and engagement as the internalized aspirations represented by the IL2S.

Furthermore, the modest influence of the OL2S can be attributed to its nature, which often focuses on avoiding negative outcomes rather than pursuing positive goals, which has the same results as the study of Wisnuwardhani(2022). Dörnyei and Chan (2013) highlighted that the OL2S is primarily concerned with fulfilling obligations and meeting expectations, which may not inspire the same enthusiasm and dedication as pursuing an Ideal L2 Self.

In this study, medical and professional programs often have rigorous language requirements. Students might be motivated to learn English simply to pass exams or meet these requirements (OL2S) in the Chinese context, but not explicitly demonstrated as intended efforts and commitment in language learning behaviors.

RQ4: How does the Second Language Learning Experience influence their motivational learning behavior?

The findings from the analysis above stress the critical role that positive second language

learning experiences play in shaping students' motivational learning behavior. The substantial impact of SLLE on MLB suggests that creating and maintaining a positive learning environment is essential for fostering student motivation in medical English courses.

The influence of positive Second Language Learning Experiences (SLLE) on students' Motivational Learning Behavior (MLB) is particularly pronounced in specialized contexts such as medical English courses in this research setting, which echoed the previous researches. Research indicates that a supportive and engaging learning environment is crucial for enhancing student motivation, which is essential for effective language acquisition in specialized fields. For instance, Iraj et al. (2021) highlight the importance of personalized and actionable feedback in fostering student engagement, suggesting that timely feedback can significantly impact students' learning outcomes and motivation levels. This aligns with findings from Nottingham and Henning (2014), who emphasized that constructive feedback confirms correct behaviors and enhances communication skills and professional competencies, which are vital in medical education. This is further supported by Carless and Boud (2018), who argued that student feedback literacy is essential for effective learning, as it encourages students to engage with feedback collaboratively, thereby enhancing their learning experience.

Moreover, the integration of interactive activities, such as role-playing medical scenarios and collaborative problem-solving tasks, has been shown to promote active student engagement and enhance motivation, which echoed the researches of Zhang (2023), and Ying and Ayub (2022). Yeager et al. (2014) also discussed how wise interventions can transform teacher-student interactions, thereby unlocking students' potential and fostering a more trusting educational environment. This is particularly relevant in the context of China's educational landscape, where traditional teaching methods may not adequately address students' motivational needs. By adopting student-centered approaches, educators can better engage learners and cater to their individual motivational profiles, which is essential for effective second language acquisition (Li, 2023; Zhu, 2023; Dai,2023; Zhang, 2024).

Additionally, it is critical to give constructive criticism that is individualized and supportive of each student's development to increase students' self-assurance and strengthen their dedication to learning. Giving comments to students while considering their emotional states is also essential because encouraging words can significantly improve the learning process as a whole (Rozental et al., 2020).

RQ5: What are the strongest predictors of motivational learning behavior in medical English courses among medical students, considering college English entrance scores, L2 motivation, IL2S, OL2S, and SLLE?

Firstly, L2 motivation was found to be a significant positive predictor of Motivational Learning Behavior, indicating that students with a strong motivational self-system are more likely to engage in behaviors supporting their language learning. This aligns with previous research that highlights the central role of L2M in motivating students to put forth effort in language learning contexts (Dörnyei, 2005). Moreover, it aligns with Dörnyei's foundational work, which emphasizes the central role of the L2M in motivating students to exert effort in language learning contexts (Papi & Teimouri, 2012; 2014), and English for medicine is no exception.

Secondly, the Second Language Learning Experience (SLLE) also emerged as a significant positive predictor, suggesting that students with positive experiences learning a second language are more likely to engage in motivated learning behaviors. Educational psychology literature has

supported the importance of positive learning experiences in enhancing motivation and learning outcomes (Ushioda, 2008). Moreover, the interplay between teacher motivational practices and student motivation has been shown to enhance the effectiveness of the L2M framework. Papi and Abdollahzadeh (2011) demonstrated that teachers' motivational strategies significantly influenced students' motivated behavior, reinforcing the idea that a supportive educational environment can amplify the effects of the L2M on student engagement. This is further supported by findings from (Wang et al., 2023), which suggested that the L2M framework can be effectively applied to understand the motivations of learners in various contexts, including the influence of self-perception on language learning.

This relationship is particularly important in ESP contexts, where students often have specific professional goals tied to their language learning. The findings of Yang and Wyatt (2021) highlighted that teachers' beliefs about their motivational practices directly impact student motivation in ESP settings. Their study emphasized the need for teachers to adopt motivational strategies that resonate with their students' specific needs and aspirations, thereby enhancing their engagement and learning outcomes. This aligns with the notion that teacher support can play a pivotal role in sustaining motivation in specialized fields like medicine, where students may feel pressure to achieve proficiency. For example, by addressing students' anxiety and fostering a supportive classroom environment, teachers can help students develop a clearer vision of their ideal L2 self, which is essential for motivation in ESP contexts.

Thirdly, the Ideal L2 Self (IL2S) showed a marginally significant favorable influence on Motivational Learning Behavior in this study. This finding suggests that students with a clear and motivating vision of their future L2 self are more likely to exhibit motivated learning behaviors. However, this effect was just above the conventional threshold for statistical significance. The role of the ideal self in motivation has been extensively discussed in L2 motivation theory (Dörnyei, 2009). This finding suggests that students' visions of their future selves as proficient language users can enhance their motivation to engage in language learning activities. However, the degree of this influence may vary depending on contextual factors and the specific nature of the ESP environment.

In the context of ESP, particularly in fields such as medicine, the IL2S can be a powerful motivator. As indicated in Alzabidi and Khadawardi's (2022) study, when students visualize themselves as competent speakers in their specific fields, they are more likely to participate actively in language learning. This aligns with the notion that motivation is a crucial factor in language acquisition, especially in specialized contexts where students may feel the pressure to achieve proficiency for professional purposes.

Moreover, Sak (2020) explored the relationship between the IL2S and WTC (Willing ness To Communicate), noting that the construct does not uniformly correlate with communication settings inside and outside the classroom. This suggests that while the IL2S can motivate students to engage in language learning, its effectiveness may be influenced by the specific classroom dynamics and the opportunities for the practical application of language skills. In medical English education, students may be more motivated to communicate in scenarios that closely resemble their future professional interactions, enhancing their learning experiences' relevance. The reason why IL2S was a weak predictor in this study may lie in the lack of authentic communicative activities related to their professions.

Ought-to L2 Self (OL2S) did not significantly predict Motivational Learning Behavior, suggesting that external obligations or expectations, such as perceived duties or responsibilities,

do not powerfully drive motivated learning behavior among these students. This finding is consistent with some studies that found the ought-to self to be less influential in language learning motivation than the ideal self (Papi, 2010).

Finally, the College Entrance English Score also did not significantly impact Motivational Learning Behavior, showing that past academic performance in English does not necessarily predict current motivation to engage in language learning behaviors. This finding may suggest that students' self-concepts and learning experiences more influence motivation in the current learning context than past achievements.

In conclusion, the L2M, SLLE, and IL2S are significant predictors of Motivational Learning Behavior, and their effectiveness can be enhanced through targeted pedagogical strategies and communicative teaching approaches that align with the specific needs and aspirations of students in ESP classrooms, such as English for Medicine. In ESP contexts, where students often have specific professional goals, fostering a strong IL2S can be particularly beneficial. By helping students develop a clear vision of their future selves as competent language users, educators can significantly enhance the motivation and engagement of students in language learning.

Conclusion

This study aimed to examine how different components of the L2MSS--namely, the Ideal L2 Self (IL2S), the Ought-to L2 Self (OL2S), and the Second Language Learning Experience (SLLE) relate to students' Motivational Learning Behaviors (MLB). The study also investigated the influence of college entrance English scores as a potential predictor of these behaviors. It is found that there are strong correlations of L2M and SLLE with MLB, suggesting that both a robust L2 Motivational Self System and positive language learning experiences are critical drivers of motivational learning behaviors in this context. The IL2S is moderately correlated with motivational behavior, indicating its importance but suggesting that it may not be as critical as L2M and SLLE in this sample. Moreover, the limited impact of OL2S on MLB suggests that external pressures or obligations play a less significant role in motivating students than internal motivations and experiences.

Moreover, the L2 Motivational Self System is an important factor in predicting motivational learning behavior. The results showed that the components of the L2 Motivational Self System play an important role in improving medical students' classroom engagement and learning effort in medical English courses, emphasizing the importance of L2 motivation, positive L2 learning experience, and the Ideal L2 self in promoting students' motivational learning behavior. The results also showed that the L2 learning experience significantly impacts medical learning behavior, indicating that improving students' language learning experience can effectively enhance their motivation and participation. Additionally, while the Ideal L2 Self showed potential as a motivator, enhancing students' vision of the future as proficient English speakers through interventions may significantly increase their engagement and effort in language learning. Last but not least, it is found that although external expectations (OL2S) can promote students' learning engagement to a certain extent, but their effect is limited. Finally, the College Entrance English Score did not significantly impact Motivational Learning Behavior, showing that past academic performance in English does not necessarily predict current motivation to engage in language learning behaviors.

Implications

This empirical study contributes to the broader understanding of language learning motivation, particularly in specialized educational contexts such as medical English classrooms. These findings provide valuable insights into the factors that influence motivational learning behavior among students, particularly emphasizing the roles of internal motivation and positive learning experiences. Medical English educators and policymakers should focus on fostering strong motivational self-systems and creating positive learning environments to enhance student engagement in language learning.

Additionally, given the relatively weak influence of OL2S on MLB, educators and program designers might focus on strengthening students' IL2S, which could be more effective in fostering long-term commitment and motivation in English language learning. Interventions that help students align their personal goals with their professional aspirations in the medical field, rather than merely responding to external pressures, may yield better motivational outcomes.

Future research could explore the potential mediating effects of other motivational factors, such as the teaching approaches and activities, to further elucidate the mechanisms through which IL2S influences MLB. Also, the current study was conducted with a relatively small sample of 80 students in a single university in Zhejiang, which may limit the generalizability of the findings. Further research could extend the geographical scope to represent the broader population of medical students in different regions or countries.

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Appendices

Appendix A

Questionnaire of L2M and Motivational Learning Behaviors

L2 Learning Motivation

1. I think that I am doing my best to learn English.
2. I usually spend lots of time studying English.
3. I can overcome the difficulties and remove interferences when I learn English.
4. No matter my teacher is strict with us or not, I will study English consciously.
5. Compared to most of my classmates, I think I study English relatively hard.
6. I have my own after-class English learning plan.

Ideal L2 self

7. I often imagine myself living abroad and communicating with local residents in English.
8. I imagine myself as someone who is able to communicate in English.
9. The things I want to do in the future require me to use English.
10. I often imagine myself speaking English as if I were a native speaker of English.
11. I often imagine myself speaking English with international friends or colleagues.
12. Whenever I think of my future career, I imagine myself using English.
13. I often imagine that if I acquired good English scores or skills, I would attract more admiration.

Ought-to L2 self

14. I study English because close friends of mine think it is important.
15. I consider learning English important because the people I respect think that I should do it.
16. Learning English is necessary because people surrounding me expect me to do so.
17. I study English in order to gain the approval of my peers/teachers/family/boss.
18. It will have a negative impact on my life if I don't learn English.
19. Studying English is important to me in order to achieve a special goal (e.g., to get a degree or get a scholarship).

Second Language Learning Experience

20. I like the atmosphere of my English classes.
21. I find learning English really interesting.
22. I always look forward to English classes.
23. I really enjoy learning English.
24. English learning is one of the most important aspects in my life.

Motivational Learning Behaviors

25. When I encounter something, I don't understand in English class, I will ask the teacher.
26. I set short-term and long-term goals for my English learning.
27. I have my own English learning plan and time line.

28. I often reflect on whether my English learning methods are effective.
29. I spend more time studying English outside of class than on other courses.
30. I preview the text before taking English class.
31. I am able to use different learning strategies according to different learning tasks.
32. I am very aware of my strengths and weaknesses in English learning.
33. I often use self-assessment tools and other methods to check my English learning.
34. I attend English classes on time.
35. I completed the English homework assigned by the teacher on time.
36. I will correct the mistakes in my English homework based on the teacher's comments.
37. For English class, I just dealt with it casually. (rc)
38. I rarely watch English programs on TV. (rc)
39. After I finish my English class, I review what I have learned.
40. I rarely participate in English extracurricular activities, such as English corners, speech or composition competitions. (rc)
41. I rarely listen to English programs on the radio. (rc)
42. I never take the initiative to answer questions in English class. (rc)
43. I often read English newspapers and magazines.