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**MODELING EFL LEARNERS' ENGAGEMENT: SERIAL
MEDIATION OF AUTONOMY SUPPORT, ENJOYMENT, AND
IDEAL L2 SELF**

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Abstract: Engagement plays a critical role in enhancing English as a Foreign Language (EFL) learning. Therefore, investigating the factors that influence engagement is essential. This study explores the mechanisms through which engagement is shaped by key factors among EFL learners, within the framework of Self-Determination Theory (SDT). Specifically, the focus is on autonomy support, enjoyment, and ideal L2 self. A total of 413 EFL learners from diverse colleges participated in an online survey, where these constructs were measured using four validated scales. Structural Equation Modeling (SEM) via AMOS 24 was employed for data analysis. The results indicated that autonomy support, enjoyment, and ideal L2 self directly and positively predicted learner engagement. Furthermore, autonomy support indirectly influenced engagement through enjoyment, ideal L2 self,

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or both. These findings highlight the significance of these factors in fostering EFL learner engagement and offer valuable insights for enhancing EFL education and guiding future research on engagement dynamics.

Keywords: *autonomy support, EFL learning, engagement, enjoyment, ideal L2 self*

INTRODUCTION

Engagement is a crucial factor for the success of learning English as a foreign language (EFL), as it indicates a positive, fulfilling, and energized state of mind that learners exhibit when they participate actively in their learning process (Wang et al., 2024; Wu, Wang, et al., 2024; Zhao & Danping, 2024). Engaged learners tend to experience various desirable outcomes, such as lower dropout rates, higher sense of belonging, better social-emotional well-being, and higher academic achievement (Archambault et al., 2022; Korpershoek et al., 2020; Palos et al., 2019). EFL learning entails unique challenges for learners, because they need to overcome various linguistic, cultural, and psychological barriers that may hinder their engagement (Karimi & Fallah, 2021; Ma et al., 2018). Therefore, it is essential to investigate the factors that promote engagement among EFL learners and to implement effective EFL instruction that supports their learning process (Wu, Zeng, et al., 2024). This way, a conducive learning environment could be created and the quality of EFL education could be improved.

In recent years, the field of EFL learning has undergone an “emotional turn” with the rise of positive psychology (PP) (Li, 2024), which emphasizes the holistic development of learners and highlights the emotional and positive factors that contribute to learners' well-being and success (Derakhshan, 2022; Wang et al., 2021; Wu & Zeng, 2024). These factors include autonomy support (the practice of providing instruction in a way that respects and fosters learners' autonomy needs and the teacher-student relationship), enjoyment (a complex emotion, capturing interacting dimensions of the challenge

and perceived ability that reflects the human drive for success in the face of difficult tasks), and ideal L2 self (the learners' ability to envision themselves as effective and competent L2 users in the future) (Dincer et al., 2019; Li, 2020; Printer, 2023). Most previous studies have focused on examining the isolated effects of these factors (e.g., autonomy support, enjoyment, ideal L2 self) or their pairwise interactions, highlighting their positive influence on learner engagement and their interrelations (Derakhshan et al., 2020; Fathi et al., 2023; Sadoughi & Hejazi, 2023; Zarrinabadi et al., 2021; Zhao et al., 2025).

However, existing research lacks an integrated approach that systematically investigates how these key constructs (autonomy support, enjoyment, and ideal L2 self) interact within the EFL learning context to collectively influence engagement. Furthermore, there is a scarcity of studies exploring the potential complex pathways (e.g., mediating effects) among these constructs and how they form an interconnected network impacting engagement. To fill this gap, the present study aims to develop and test a comprehensive model to investigate the mechanisms underlying the interactions between autonomy support, enjoyment, ideal L2 self, and learner engagement. Understanding the interplay between these constructs can provide valuable insights into the underlying mechanisms that foster EFL learners' engagement and inform educational practices that aim to create a supportive learning environment for EFL learners.

We adopted Self-Determination Theory (SDT) as the theoretical framework. SDT is a major theory of motivation that posits that people are driven by their basic psychological needs for autonomy, competence, and relatedness (Deci & Ryan, 2015). These needs are essential for human flourishing and well-being. On the other hand, PP is a scientific discipline that investigates the factors and processes enabling individuals and communities to thrive and flourish (Wang et al., 2021). In light of their common principles, Sheldon and Ryan (2011) contend that SDT is a prototypical PP theory, as it offers a comprehensive, nuanced, and empirically supported framework for understanding optimal human functioning, as well as the barriers that

can hinder it. Since MacIntyre and Mercer (2014) integrated of PP principles in the field of EFL learning, SDT was also introduced to this field accordingly to provide an effective theoretical framework for language researchers (Al-Hoorie et al., 2023; Dincer et al., 2019; Printer, 2023; Wu & Wang, 2025).

In SDT, the associations between autonomy support, intrinsic motivation, satisfaction, and engagement are elucidated (Ryan & Deci, 2017). Specifically, autonomy support is a premise for high engagement, as it activates individuals' intrinsic motivational resources. The direct effect of autonomy support is the satisfaction of the three basic needs, which then leads to higher intrinsic motivation and engagement (Zhang et al., 2021). Within PP research, Ryan et al. (2006) provide a SDT perspective that implicitly defines enjoyment as the satisfaction of three basic psychological needs. This perspective has been applied to the later empirical studies (Grasse et al., 2022; Tamborini et al., 2010; Tamborini et al., 2011). Besides, in the field of EFL learning, the concept of ideal L2 self is considered to be a form of intrinsic motivation (Cho, 2020). Hence, based on the rationale of SDT, we propose a serial mediation model in which autonomy support fosters enjoyment, which in turn enhances ideal L2 self and ultimately promotes EFL learners' engagement (Figure 1).

The connections between these variables are also suggested in prior empirical literature. Concerning the links between engagement and autonomy support, Dincer et al. (2019) conducted a study with 412 EFL learners and found that their perception of teachers' autonomy support in the classroom predicted their need satisfaction, which in turn led to self-determined engagement. Similarly, Sadoughi and Hejazi (2021) surveyed 435 college students and revealed that perceived teacher support had a direct and positive effect on EFL learners' engagement. More recently, Liu et al. (2023) examined a sample of 466 college students and demonstrated that autonomy support influenced engagement through self-efficacy and mastery goals.

Regarding the empirical associations between enjoyment and engagement, the extant literature has found that enjoyment can strengthen engagement by creating a positive classroom atmosphere, reducing students' negative emotions, and enhancing students' interest (Dewaele & Li, 2021; Mohammad Hosseini et al., 2022; Wu, 2025). As for the empirical evidence for the relationships between engagement and ideal L2 self, it was found that EFL learners who have a clear and vivid image of their ideal L2 self are more motivated to engage in learning activities (Cho, 2020). Ideal L2 self can also enhance engagement by increasing EFL learners' self-efficacy and positive attitudes towards the target language (Sadoughi et al., 2023; Zhu et al., 2023).

However, the relationship between ideal L2 self and autonomy support is an underexplored area in EFL learning. However, some studies have suggested that autonomy support may have a positive impact on ideal L2 self, especially when ideal L2 self is considered as a type of intrinsic motivation (Wu & Liu, 2025). For instance, Zarrinabadi et al. (2021) found that learners who perceived more autonomy support from their teachers were more likely to adopt a growth mindset, which enhanced their intrinsic motivation. Likewise, Alrabai (2021) reported that a group of EFL learners who received more autonomy support in their classes showed higher intrinsic motivation than the control group. Besides, EFL learners' enjoyment can also be affected by autonomy support. For instance, Sadoughi and Hejazi (2021) discovered that autonomy support could elicit positive emotions such as enjoyment among EFL learners. Likewise, An et al. (2023) confirmed the vital role of autonomy support in fostering EFL learners' enjoyment.

Finally, enjoyment and ideal L2 self are two interrelated concepts in EFL learning that have received some empirical support in recent years. However, their relationship remains ambiguous. Some studies suggest that ideal L2 self may be affected by enjoyment, especially when it is considered as a form of motivation. Liu (2022) proposed that enjoyment was a key factor that promoted EFL learners' motivation in her conceptual work. Empirically, Fathi and Mohammaddokht (2021)

examined the role of enjoyment and anxiety in predicting ideal L2 self among 195 EFL learners and found that enjoyment was a stronger predictor of ideal L2 self. In the same vein, Wang et al. (2023) explored how enjoyment and motivation contributed to EFL performance with a sample of 512 EFL learners. The results indicated that learners who perceived more enjoyment tended to have a more vivid ideal L2 self, which in turn improved their EFL performance.

In light of the previous theoretical and empirical literature, we propose that enjoyment and ideal L2 self mediate the effect of autonomy support on engagement. That is, we hypothesize that autonomy support fosters students’ enjoyment and ideal L2 self, which in turn enhance their engagement in EFL learning. We formulated the following hypotheses:

- H1:** Autonomy support positively predicts engagement.
- H2:** Autonomy support positively predicts engagement via enjoyment.
- H3:** Autonomy support positively predicts engagement via ideal L2 self.
- H4:** Autonomy support positively predicts engagement via the serial mediation of enjoyment and ideal L2 self.

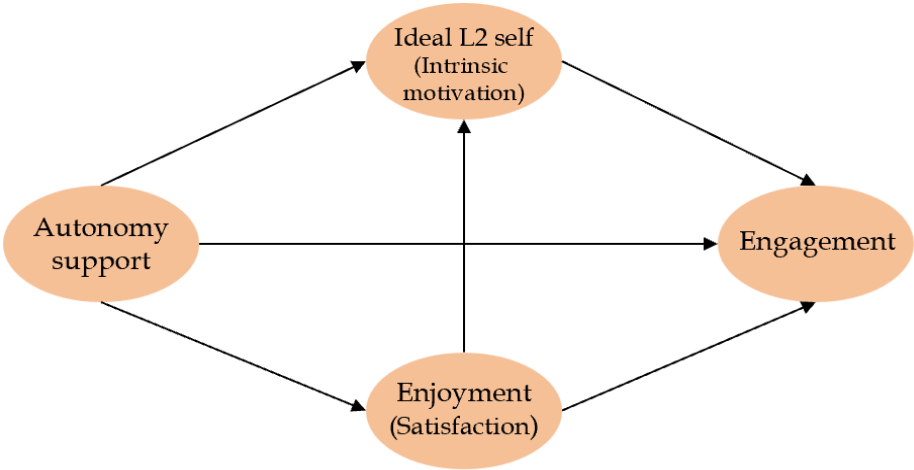


Figure 1. The SDT-based serial mediation model of EFL learners’ engagement

METHOD

Research Design

This study utilized a cross-sectional quantitative research design to explore the relationships between autonomy support, enjoyment, ideal L2 self, and learner engagement. Cross-sectional designs involve collecting data at a single point in time to examine the relationships between variables and test hypothesized models (Creswell & Creswell, 2018). This approach was chosen for three main reasons:

This approach was chosen for three main reasons: first, in terms of efficiency, it allows for the capture of current states of complex psychological constructs in real-world educational settings (Wang et al., 2021); second, regarding analytical suitability, it facilitates robust testing of mediation pathways using SEM (Hayes, 2018); and third, in terms of practicality, it supports large-scale sampling across diverse regions (Dornyei, 2007).

Participants

This study utilized convenience sampling to recruit participants. The initial sample comprised 423 students from universities across Zhejiang, Hunan, Jilin, and Jiangsu provinces in China. Following data screening, 10 participants were excluded based on the following criteria: (1) they gave identical responses to all items; (2) They gave incomplete responses. Thus, the final analytical sample consisted of 413 students.

Their demographic characteristics are as follows: in terms of academic standing, 62.47% ($n = 258$) were freshmen, 33.66% ($n = 139$) were sophomores, 3.63% ($n = 15$) were juniors, and 0.24% ($n = 1$) were a senior; in terms of gender distribution, 38.74% ($n = 160$) were male and 61.26% ($n = 253$) were female; and regarding age range, the students were between 18 and 23 years old, with a mean age of 18.81 and a standard deviation of 0.948.

To ensure the validity of the self-reported scales pertaining to autonomy support, ideal L2 self, and engagement, we employed a translation and back-translation procedure. Three bilingual researchers translated the scales from English into Chinese and back-translated them into English.

Then, one expert in psycholinguistics and one expert in translation further reviewed and revised the wording of the items to reach the closest semantic equivalence across the English and Chinese versions. We required participants to complete the Chinese scales, but we also provided them with the English scales so that they could check the original meaning of items whenever needed.

Instruments

Autonomy Support

This study measured the perceived autonomy support of EFL students using the short version of the Learning Climate Questionnaire (LCQ) by Yu et al. (2018). The instrument has six items that the participants rated on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). The total scores ranged from 7 to 42, with higher scores indicating higher levels of autonomy support. The overall reliability of the scale in this study was 0.856.

Enjoyment

This study measured EFL students' enjoyment using the Chinese version of the Foreign Language Enjoyment Scale (C-FLES) developed by Li et al. (2018). The C-FLES has three subscales: FLE-Private (5 items), FLE-Teacher (3 items), and FLE-Atmosphere (3 items). The participants rated each item on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). The total scores ranged from 7 to 35, with higher scores representing higher enjoyment. The overall reliability of the scale in this study was 0.957.

Ideal L2 Self

This study employed the Ideal L2 Self Scale by Li (2014) to assess the level of ideal L2 self that EFL students possessed. The instrument has five items that the participants rated on a 6-point Likert scale from 1 (strongly disagree) to 6 (strongly agree). The total scores ranged from 6 to 36, with higher scores indicating a stronger ideal L2 self. The reliability of the scale in this study was 0.930.

Engagement

This study assessed the EFL students' engagement using the Utrecht Work Engagement Scale for Students (UWES-9S) by Carmona-Halty et al. (2019). The UWES-9S consists of 9 items that measure three dimensions of student engagement: vigor, dedication, and absorption, with 3 items for each dimension. The participants rated each item on a 6-point Likert scale from 1 (strongly disagree) to 6 (strongly agree). The overall reliability of the scale in this study was 0.976.

Data Collection

The participants of this study were English majors from various universities in China, who were recruited with the assistance of EFL teachers. The data collection was conducted online using Wenjuanxing, a platform for creating and distributing questionnaires. The participants were required to provide their demographic information and complete four self-reported scales. Before the study began, the participants who volunteered to join the study signed an informed consent form that outlined the research procedure, confidentiality, and anonymity.

Data Analysis

This study employed AMOS 24 to perform data analysis. Following the two-stage structural equation modeling (SEM) approach suggested by Kline (2016), the measurement model was verified first, which assessed the reliability and validity of the constructs. Several indices were used to evaluate the goodness-of-fit of the models, including Chi-square divided by degree of freedom (χ^2/df),

Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA) (Hu & Bentler, 1999).

Next, the data were examined for skewness, kurtosis, and descriptive statistics to ensure their normality and suitability for further analysis. Then, the structural model (namely, the proposed serial mediation model) was tested, which examined the causal relationships among the constructs. The “Maximum Likelihood” method was used to estimate the parameters of the models. Moreover, the bootstrapping technique with 5000 iterations was applied to test the significance of the indirect effects (Shrout & Bolger, 2002). The hypotheses were tested using a significance level of 0.05. All path coefficients and mediation effects were considered statistically significant if the associated *p*-value was less than 0.05 or if the 95% bias-corrected bootstrap confidence interval (CI) did not include zero (Hayes, 2018).

RESULTS

Testing the Measurement Model

We performed confirmatory factor analysis (CFA) to ensure construct validity. The initial model consisted of four constructs: autonomy support, enjoyment, ideal L2, and engagement. Among them, enjoyment and engagement had several components, making the model a second-order one.

Table 1. Evaluation of the CFA goodness of fit

Criteria	Cutoff				Evaluation
		Terrible	Acceptable	Excellent	
χ^2/df	3.274	> 5	> 3	> 1	Acceptable
RMSEA	0.074	> 0.08	< 0.08	< 0.06	Acceptable
CFI	0.942	< 0.9	> 0.9	> 0.95	Acceptable
TLI	0.936	< 0.9	> 0.9	> 0.95	Acceptable
SRMR	0.068	> 0.1	> 0.08	< 0.08	Excellent

The model was tested for non-significant or low factor loadings using both unstandardized and standardized estimates. Items AS4 and AS5 were removed as their factor loadings were below 0.45 (Kline,

2016). Next, modification indices with the threshold of 10 were checked, and suggestions that were not contradictory to the literature were applied (see Figure 2).

The model's goodness of fit was tested using the criteria suggested by Hu and Bentler (1999). The criteria and the corresponding values from the data are shown in Table 1. The results indicate that the model fitted the data well.

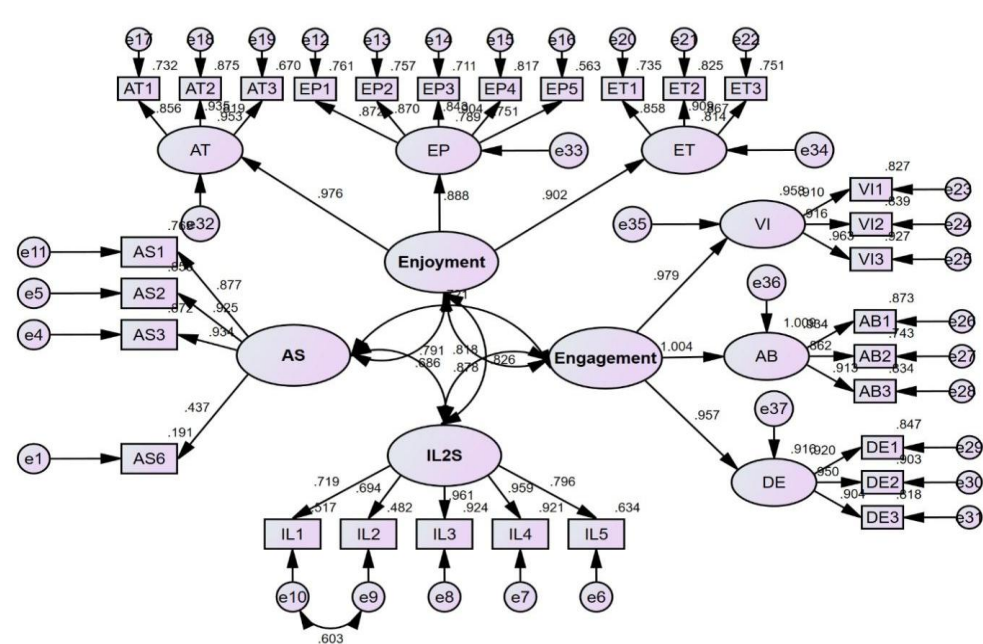


Figure 2. The final modified measurement model with standardized estimates

Note: EP = FLE-Private; ET = FLE-Teacher; EA = FLE-Atmosphere; AS = autonomy support; IL2S = ideal L2 self; VI = vigor; AB = absorption; DE; dedication

Table 2 presents the discriminant validity and composite reliability (CR) of each factor in the model. All factors have CR values above 0.7, indicating acceptable reliability. Moreover, all factors had average variance explained (AVE) values above 0.5 and maximum

shared variance (MSV) values below their AVE, which support the convergent validity of the model.

The Fornell-Larcker criterion revealed that all factors are significantly correlated with each other, with the high correlations between enjoyment and engagement ($r = 0.878$), enjoyment and ideal L2 self ($r = 0.826$), ideal L2 self and engagement ($r = 0.818$), autonomy support and ideal L2 self ($r = 0.791$), autonomy support and engagement ($r = 0.721$), and autonomy support and enjoyment ($r = 0.686$) (Plonsky & Oswald, 2014).

The square root of AVE for each factor (the bold values in the table) was higher than its inter-correlations with other factors, confirming the discriminant validity of the model (Fornell & Larcker, 1981).

Table 2. Convergent and discriminant validity

	Fornell - Larcker Criterion					
	CR	AVE	1	2	3	4
1. AS	0.885	0.672	0.820			
2. Enjoyment	0.945	0.852	0.686***	0.923		
3. IL2S	0.918	0.696	0.791***	0.826***	0.834	
4. Engagement	0.987	0.961	0.721***	0.878***	0.818***	0.980

Note: AS = autonomy support; IL2S = ideal L2 self; *** $p < 0.001$.

Testing the Structural Model

After confirming the convergent and discriminant validity of the CFA model, we proceeded to use the model’s data for further analysis. Table 3 displays the descriptive statistics. As per Kline (2016), a skewness and kurtosis value between -2 and +2 is typically considered indicative of a normal distribution.

Table 3. Descriptive statistics of the variables

	Min	Max	Mean	Skewness	Kurtosis
AS	1	7	5.06~5.30	-0.44~0.01	-0.29~0.67
Enjoyment	1	5	3.24~4.23	-0.61~-0.10	-0.27~0.48
IL2S	1	6	4.60~4.83	-0.78~-0.49	0.21~1.07
Engagement	1	6	4.10~4.59	-0.60~-0.19	-0.35~0.41

The data in Table 3 show that the scores for each item of the constructs were normally distributed, with skewness and kurtosis values ranging from -0.78 to 1.07. Therefore, the data satisfied the assumptions required for SEM.

To examine the relationships among autonomy support, enjoyment, ideal L2 self, and engagement, we performed a regression analysis using SEM. The structural model (the serial mediation model) for this analysis is presented in Figure 3.

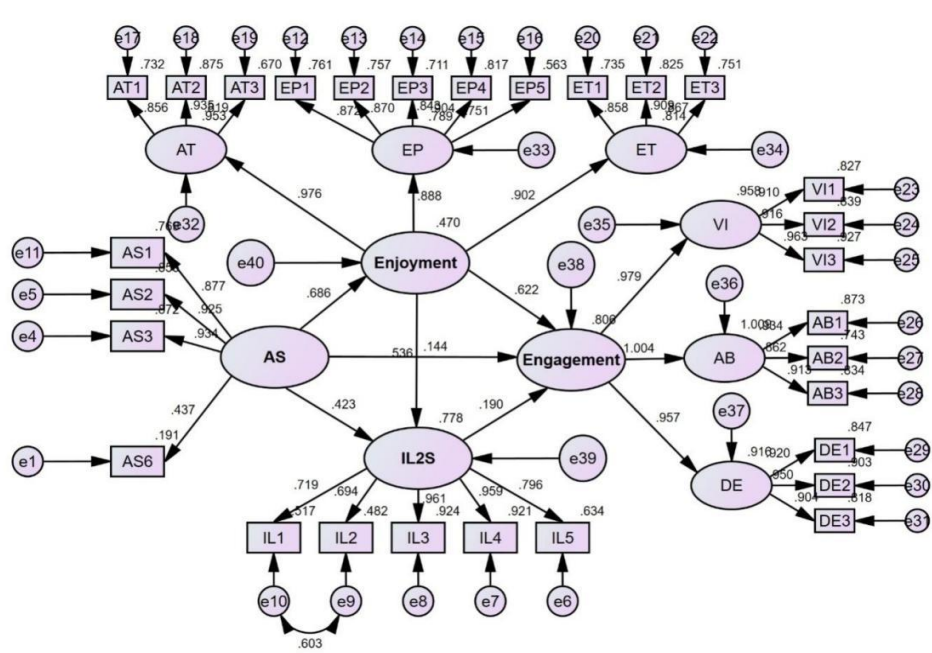


Figure 3. The serial mediation model with standardized estimates
Note: EP = FLE-Private; ET = FLE-Teacher; EA = FLE-Atmosphere; AS = autonomy support; IL2S = ideal L2 self; VI = vigor; AB = absorption; DE; dedication

Table 4 shows the results of the direct path analysis. The results indicate that autonomy support had significant and positive effects on engagement ($\beta = 0.144, p < 0.001$), enjoyment ($\beta = 0.686, p < 0.001$), and ideal L2 self ($\beta = 0.423, p < 0.001$). Thus, H1 was confirmed. Moreover, enjoyment was found to have significant and positive effects on both

engagement ($\beta = 0.624, p < 0.001$) and ideal L2 self ($\beta = 0.590, p < 0.001$). Finally, ideal L2 self also had a significant positive effect on engagement ($\beta = 0.173, p < 0.001$).

Table 4. Bootstrapping analyses of results of direct effects

Direct path	β	SE	p
AS $\rightarrow$ Enjoyment	0.686	0.137	0.000
AS $\rightarrow$ IL2S	0.423	0.108	0.000
AS $\rightarrow$ Engagement	0.144	0.078	0.003
Enjoyment $\rightarrow$ IL2S	0.536	0.056	0.000
Enjoyment $\rightarrow$ Engagement	0.622	0.061	0.000
IL2S $\rightarrow$ Engagement	0.190	0.056	0.002

Note: β = standardized path coefficient. SE = standard error.

Table 5 displays the results of the indirect path analysis. The results reveal that autonomy support had significant and positive indirect effects on engagement through three different paths: (1) through enjoyment ($\beta = 0.427, 95\% \text{ CI } [0.316, 0.542]$), (2) through ideal L2 self ($\beta = 0.081, 95\% \text{ CI } [0.019, 0.171]$) and (3) through the serial mediation of enjoyment and ideal L2 self ($\beta = 0.070, 95\% \text{ CI } [0.019, 0.125]$) These results supported H2, H3, and H4, respectively.

Table 5. Bootstrapping analyses of results of indirect effects

Indirect path	β	95% CI
1. AS $\rightarrow$ Enjoyment $\rightarrow$ Engagement	0.427	[0.316, 0.542]
2. AS $\rightarrow$ IL2S $\rightarrow$ Engagement	0.081	[0.019, 0.171]
3. AS $\rightarrow$ Enjoyment $\rightarrow$ IL2S $\rightarrow$ Engagement	0.070	[0.019, 0.125]
C1: Indirect path 1 – Indirect path 2	0.346	[0.170, 0.514]
C2: Indirect path 1 – Indirect path 3	0.357	[0.218, 0.520]
C3: Indirect path 2 – Indirect path 3	0.011	[-0.025, 0.080]

Note: β = standardized path coefficient.

In addition, the AMOS output provided three contrast values (C1, C2, and C3) to compare the strength of the indirect effects. The results showed that the indirect effect of path 1 was significantly larger than that of path 2 ($\beta = 0.346, 95\% \text{ CI } [0.170, 0.514]$) and path 3 ($\beta = 0.357, 95\%$

CI [0.218, 0.520]) while the indirect effects of path 2 and path 3 ($\beta = 0.011$, 95% CI [-0.025, 0.080]) were not significantly different from each other.

DISCUSSION

This study aimed to examine the effects of students' affective and motivational factors on their learning practices in EFL contexts. Specifically, the study explored how autonomy support, enjoyment, and ideal L2 self predicted EFL learners' engagement. Initially, the construct validity and reliability of the measures used in the study were confirmed. Then, the results of model test revealed the relationships among the variables and supported all the hypotheses of the study.

The results supported the first hypothesis that autonomy support positively influenced engagement. This implies that students tend to be more immersive in EFL learning when teachers adopt an autonomy-supportive approach, which involves offering choices and acknowledge their perspectives, and encouraging self-initiation. This finding was in line with the empirical evidence from previous studies that demonstrated the vital role of autonomy support in fostering students' engagement in both general education (Yang, Cai, et al., 2022; Yang, Chen, et al., 2022) and the EFL learning context (Javidkar et al., 2022; Sadoughi & Hejazi, 2023). These studies suggested that EFL learners who perceived more autonomy support from their teachers were more likely to be actively involved in the learning process, which enhanced their self-regulation, control, and grit (Javidkar et al., 2022; Sadoughi & Hejazi, 2023). These attributes, in turn, facilitated students' engagement in EFL learning. This finding also aligned with the theoretical framework of SDT (Ryan & Deci, 2017), which proposed that autonomy support could increase engagement by satisfying the basic psychological needs of learners. Therefore, it could be inferred that the effect of autonomy support on engagement could be either direct or indirect, mediated by other psychological factors.

The second hypothesis, which proposed that enjoyment mediated the relationship between autonomy support and engagement, was also confirmed by the results (path 1: autonomy support → enjoyment → engagement). This suggested that the students who perceive more support by their teachers in terms of their autonomy are more likely experience greater enjoyment in the EFL learning activities. This positive affective state enhances their engagement in EFL learning. This finding corroborated the previous empirical studies which demonstrated that EFL learners provided with autonomy support could develop a sense of ownership and interest in their learning process, which resulted in more positive emotions such as enjoyment and greater effort and attention to their tasks (An et al., 2023; Sadoughi & Hejazi, 2021). This finding could be rationalized by the principles of SDT. According to Ryan et al. (2006), enjoyment was implicitly conceptualized as an indicator of satisfaction in this study. As discussed above, autonomy support could facilitate the satisfaction of the three basic psychological needs, which in turn could increase engagement (Ryan & Deci, 2020). Therefore, enjoyment mediated the positive effect of autonomy support on EFL learners' engagement.

The third hypothesis was supported by the finding that autonomy support had a positive indirect effect on engagement through ideal L2 self (path 2: autonomy support → ideal L2 self → engagement). This implies that students who perceived more autonomy support from their teachers were more likely to develop a clear and positive vision of themselves as proficient EFL users in the future, which in turn motivated them to engage more effectively in EFL learning. This finding was in agreement with both SDT (Ryan & Deci, 2020) and the L2 motivational self system (Cho, 2020), which regard ideal L2 self as a type of intrinsic motivation that can be fostered by autonomy support. Previous studies have also suggested the potential influence of ideal L2 self as a mediator between autonomy support and engagement. On the one hand, autonomy support was found to enhance EFL learners' intrinsic motivation (Alrabai, 2021; Zarrinabadi et al., 2021). On the other hand, EFL learners who had a strong ideal L2

self were found to be more engaged in learning (Sadoughi et al., 2023; Zhu et al., 2023). Therefore, our finding validated the empirical and theoretical evidence for the potential mediating role of ideal L2 self between autonomy support and engagement in the field of EFL learning.

Moreover, it confirmed the serial mediation model of autonomy support, enjoyment, ideal L2 self and engagement (path 3: autonomy support → enjoyment → ideal L2 self → engagement), supporting the fourth hypothesis. This means that when EFL learners perceive their environment as autonomy-supportive, they may experience more enjoyment, which helps them develop a stronger ideal L2 self, and ultimately increases their engagement. Previous studies have only provided some evidence for the potential influence of the individual mediators of enjoyment and ideal L2 self. For instance, autonomy support has been shown to enhance EFL learners' enjoyment (An et al., 2023; Sadoughi & Hejazi, 2021) and ideal L2 self (Alrabai, 2021; Zarrinabadi et al., 2021). Likewise, enjoyment (Dewaele & Li, 2021; Mohammad Hosseini et al., 2022) and ideal L2 self (Sadoughi et al., 2023; Zhu et al., 2023) have been found to increase EFL learners' engagement. Our finding contributed to the extant literature by revealing the mechanism underlying the four constructs, which has not been empirically examined before. Besides, our finding also fully validated the theoretical assumptions of SDT that point out the serial mediating roles of enjoyment and ideal L2 self in the field of EFL learning (Csizér, 2019; Ryan & Deci, 2020), thus further demonstrating the applicability of SDT in this field.

Finally, a comparison of the three indirect paths revealed that the indirect effect of path 1 (autonomy support → enjoyment → engagement) was significantly larger than that of path 2 (autonomy support → ideal L2 self → engagement) and path 3 (autonomy support → enjoyment → ideal L2 self → engagement). However, there was no significant difference between the indirect effects of path 2 and path 3. These results suggest that both enjoyment and ideal L2 self mediated the relationship between autonomy support and engagement in EFL

learning, but enjoyment had a stronger influence. This also indicates that the ideal L2 self alone may not be sufficient to maintain students' engagement in EFL learning when they face difficulties or challenges. Therefore, it is important to foster students' enjoyment as well as their ideal L2 self in EFL learning simultaneously.

IMPLICATIONS AND LIMITATIONS

This study makes several theoretical contributions to the field of EFL learning. First, it validates the implicit definition of enjoyment as the outcome of satisfaction proposed by Ryan et al. (2006), which has not been tested empirically before. Second, it provides empirical evidence for the applicability of SDT in the context of EFL learning, especially in China, where autonomy support may be less prevalent (Qian, 2022). Third, it offers novel insights into the mechanisms by which EFL learners' autonomy support affects engagement, by examining the mediating roles of enjoyment and ideal L2 self.

This study also has several educational implications for EFL teachers and learners. One implication is that EFL teachers should adopt an autonomy-supportive teaching style, which can foster learners' sense of agency and choice in their learning process. This can lead to higher levels of enjoyment and motivation among learners, as they feel more aligned with their own interests and goals. Another implication is that EFL learners should seek to enjoy their EFL learning, which can also boost their engagement. Enjoyment can create positive emotions and attitudes towards learning, thus facilitating students' persistence and effort. A third implication is that EFL learners should construct their ideal L2 self, which can also increase their engagement. The ideal L2 self can provide a clear and attractive vision of one's future self as a successful L2 user, so that EFL learners could be motivated to commit and involve themselves in their learning.

Despite its significance, this study has some limitations that warrant further attention. First, this study only used self-reported scales to collect quantitative data, which may cause social desirability bias and overlook individual differences. Future study could adopt a

mixed-methods approach or other methods to triangulate the data and provide richer insights (Derakhshan et al., 2023). Second, this study employed a cross-sectional design, which prevents the examination of the longitudinal causality among autonomy support, enjoyment, ideal L2 self, and engagement. A possible solution is to adopt a cross-lagged panel model to capture the dynamic relationships among these variables over time. Furthermore, this study only focused on the effects of EFL learners' psychological factors on their engagement, without considering the role of teacher-related factors. Future study could explore how teacher characteristics and behaviors influence EFL learners' engagement (Wu et al., 2023).

CONCLUSION

This study explored the relationships between EFL learners' engagement and three variables derived from SDT: autonomy support, enjoyment, and ideal L2 self. A sample of 440 Chinese English majors completed four questionnaires to measure these variables. The data were subjected to statistical analysis, which yielded the following findings. First, all three variables were positively and significantly related to engagement, with enjoyment being the strongest predictor. Second, autonomy support influenced engagement indirectly through enjoyment. Third, autonomy support also influenced engagement indirectly through ideal L2 self. Fourth, autonomy support influenced engagement indirectly through the serial mediation of enjoyment and ideal L2 self. These results suggest that autonomy support, enjoyment, and ideal L2 self are important factors for enhancing EFL learners' engagement.

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