

The Relationship between EFL Learners' Growth Language Mindsets and School Engagement: The Mediating Role of Cognitive Flexibility

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Abstract: A growth language mindset is critical in enhancing language school engagement. However, the underlying mechanisms through which this mindset influences school engagement remain insufficiently understood. To address this gap, the present study introduces cognitive flexibility as a potential mediator to examine the internal mechanisms linking growth language mindset and school engagement among EFL learners. The findings reveal that a growth language mindset is significantly associated with higher levels of school engagement, suggesting that learners who believe in the malleability of their language abilities are more likely to engage actively and persistently in the language learning process. Moreover, cognitive flexibility was identified as a mediator, highlighting its role in facilitating greater involvement in learning. These results emphasize the importance of promoting a growth language mindset in EFL contexts, as it can not only boost learner engagement but also improve language learning outcomes.

1. Introduction

School engagement is a cornerstone of students' overall development, which not only influences their academic performance but also their emotional, social, and behavioral well-being ^[1]. Engaged students are more likely to actively participate in class, complete assignments, and demonstrate initiative in their learning. These behaviors are strongly associated with improved academic outcomes, such as higher grades and test scores ^[2]. In the context of language education, fostering school engagement is particularly crucial. One key factor influencing language learners' school engagement is their mindset—specifically, a growth language mindset, which refers to the belief that language abilities can be developed through sustained effort, practice, and perseverance ^[3].

In the context of English as a Foreign Language (EFL) learning, where students frequently encounter challenges and navigate the complexities of acquiring a second language, their level of engagement in the learning process is a crucial determinant of their academic achievement. Previous studies have suggested that factors such as language mindsets and cognitive flexibility play important roles in fostering greater involvement ^[4-5]. However, the interactive effects of these factors remain inadequately explored. Investigating the combined influence of a growth language mindset and cognitive flexibility could provide deeper insights into how cognitive and motivational aspects collectively contribute to EFL learners' school engagement in the learning process.

1.1 Growth Language Mindsets and School Engagement

Although there is no universally accepted definition of “school engagement” in the academic literature, it is generally conceptualized as consisting of three dimensions: cognitive, emotional, and behavioral ^[6]. Given the strong positive relationship between school engagement and academic achievement ^[7], research on student engagement has increased significantly in recent years. The growth language mindset was revealed to be positively related to students’ school engagement. In other words, students with a growth language mindset tended to be more engaged in their language learning ^[8]. In contrast, those who viewed language ability as an innate trait that couldn’t be improved were more likely to experience anxiety in facing language tasks, fearing making mistakes or being laughed at, which may lead to avoidance behaviors and lower school engagement ^[9].

Furthermore, a large-scale study employing structural equation modeling demonstrated that a growth language mindset not only directly predicts undergraduate students’ learning engagement but also exerts an indirect influence through both positive and negative emotions ^[10]. However, the internal mechanisms through which a growth mindset influences school engagement remain poorly understood. The current study aims to examine the predictive role of a growth mindset on school engagement and further explore how it impacts the latter.

1.2 Cognitive Flexibility and School Engagement

Cognitive flexibility, a key component of cognitive control, refers to an individual’s ability to shift between thinking about different or multiple concepts simultaneously ^[11]. This ability plays a crucial role in various cognitive processes across different domains, particularly for EFL learners, who frequently shift between their native language and English. Effective language learning at different stages necessitates the involvement of cognitive control mechanisms. As one of the core elements of cognitive control, a higher level of cognitive flexibility has been shown to be positively correlated with improved academic performance in students ^[12].

Previous research has also demonstrated that cognitive flexibility was closely linked to school engagement and the former could positively predict the latter to some degree ^[13]. Students who exhibited cognitive flexibility were better equipped to handle setbacks and perceive challenges as growth opportunities, which may foster emotional engagement and enhance their motivation to persist ^[14]. Moreover, high cognitive flexibility could drive students to be more cognitively engaged by enabling them to invest greater effort in acquiring the language and establishing connections across diverse linguistic and cultural contexts ^[15].

In addition, both a growth language mindset and cognitive flexibility promote the perception of challenges and mistakes as opportunities for development, leading to sustained effort and continued engagement in the learning process. Despite these individual benefits mentioned above, the combined effect of a growth language mindset and cognitive flexibility on EFL learners’ school engagement remains underexplored.

1.3 The Current Study

Previous research has demonstrated that both growth language mindset and cognitive flexibility were positively associated with school engagement, with each serving as an independent predictor of higher engagement. Specifically, a growth language mindset promoted a focus on effort and development, while cognitive flexibility facilitated adaptive thinking in response to academic challenges, both contributing to enhanced school engagement. However, despite these individual findings, no studies have yet examined the combined influence of these two factors on school engagement. The present study aimed to address this gap by exploring the joint impact of a growth

language mindset and cognitive flexibility on school engagement among EFL learners. To guide this investigation, the study addressed two key research questions (**Figure 1** is the hypothesis model):

Q1: How do language mindsets and cognitive flexibility affect EFL learners' school engagement?

Q2: What role does cognitive flexibility play in the relationship between EFL learners' language mindsets and school engagement?

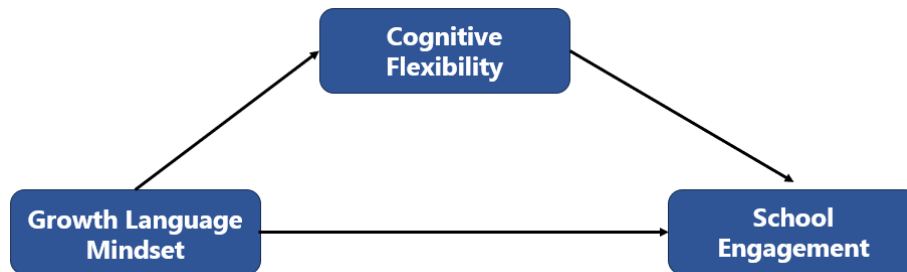


Figure 1: The hypothesized model

2. Methods

2.1 Participants

118 participants were involved in the current study. After deleting the questionnaire data whose response time was too short, 115 valid data were obtained, comprising 12.17% male and 87.83% female participants. Participants' ages ranged from 18 to 23 ($M = 20.1$, $SD = 1.13$). All of them were native Mandarin speakers with over 10 years of experience learning English as a second language. For the convenience of the participants, the original English instruments were translated into Chinese by two professional translators proficient in both languages. Participants completed the questionnaire via a widely used online platform. Additionally, all participants were right-handed and reported no history of neurological or psychiatric disorders, or substance abuse.

2.2 Instruments

(1) Growth Language Mindsets

The Growth Language Mindsets Inventory ^[16] was employed to assess participants' language-related beliefs. This instrument consists of 9 items that measure three distinct dimensions: general language intelligence beliefs (GLB), second language aptitude beliefs (L2B), and age sensitivity beliefs regarding language learning (ASB). All items are rated on a 6-point Likert scale (1 = "strongly disagree" to 6 = "strongly agree"). The scale demonstrated high internal consistency, with Cronbach's α values of 0.930, indicating satisfactory reliability.

(2) Cognitive Flexibility

Participants' cognitive flexibility was measured by the Cognitive Flexibility Inventory ^[17]. The inventory includes 20 items rated on a 5-point Likert scale (1 = "strongly disagree" to 5 = "strongly agree"), with reverse-scored items at positions 2, 4, 7, 9, 11, and 17. Higher overall scores indicate greater cognitive flexibility. The scale exhibited strong internal consistency, with a Cronbach's α of 0.827, confirming its reliability for this sample.

(3) School Engagement

School engagement was evaluated by the Agentic Engagement Scale for Foreign Language Learning ^[18], a 14-item instrument that measures involvement across four dimensions: individual effort, assisting teachers, collaboration with teachers, and supporting classmates' learning. Items were rated on a 5-point Likert scale (1 = "strongly disagree" to 5 = "strongly agree"), with reverse-coded

items appropriately adjusted in the final scoring. Higher total scores reflect greater school engagement. This scale showed high internal consistency reliability in the current study (Cronbach's $\alpha = 0.904$).

2.3 Procedure and Statistical Analysis

The data were analyzed using SPSS 27 and PROCESS v4.1. The analysis employed several statistical methods, including descriptive statistics, correlation analysis, and regression analysis. Descriptive statistics were initially applied to summarize and provide an overview of the participants' characteristics. Correlation analysis was then conducted to examine the relationships between language mindsets, cognitive flexibility, and school engagement. Regression analysis was performed using PROCESS v4.1, with language mindsets as the independent variables, school engagement as the dependent variable, and cognitive flexibility as the mediator. To assess the significance of the multiple mediation effect, 5,000 bootstrap samples were generated, and the 95% bias-corrected confidence interval (95% CI) was used. This approach enabled the examination of both the direct effect of language mindsets on school engagement and the indirect effect through cognitive flexibility.

3. Results

3.1 Descriptive Statistics and Correlation Analysis

The descriptive statistics for all variables were presented in **Table 1**. The mean scores for growth language mindset ($M = 4.28$, $SD = 0.78$), cognitive flexibility ($M = 3.53$, $SD = 0.33$), and school engagement ($M = 3.39$, $SD = 0.42$) were all above the moderate scale midpoint.

Table 1 also presented the observed correlations between the measured variables. A significant positive correlation was found between growth language mindset and cognitive flexibility ($r = 0.273$, $p < 0.01$), as well as between growth language mindset and school engagement ($r = 0.344$, $p < 0.001$). Additionally, cognitive flexibility was positively correlated with school engagement ($r = 0.269$, $p < 0.01$).

Table 1: Descriptive statistics and observed correlations

	<i>Min</i>	<i>Max</i>	<i>M</i>	<i>SD</i>	1	2	3
1. Growth Language Mindset	2.67	6.00	4.28	0.78	1		
2. Cognitive Flexibility	2.50	4.25	3.53	0.33	0.273**	1	
3. School Engagement	2.43	4.50	3.39	0.42	0.344***	0.269**	1

** $p < 0.01$, *** $p < 0.001$

3.2 Regression Analysis

The PROCESS (v. 4.1) extension for SPSS 27.0 was used to conduct the regression analysis. The mediation analysis was performed to explore both the predictive effects of growth language mindset and cognitive flexibility on school engagement, as well as the mediating role of cognitive flexibility in the relationship between growth language mindset and EFL learners' school engagement. The influence paths and path coefficients are presented in **Table 2**.

Table 2: Influence paths and path effects

Path	<i>Coeff</i>	<i>SE</i>	<i>LLCI</i>	<i>ULCI</i>
GLM→ CF	0.1154	0.0383	0.0395	0.1912
GLM→ SE	0.1580	0.0489	0.0610	0.2549
CF→ SE	0.2418	0.1157	0.0125	0.4710
GLM→ CF→ SE	0.0279	0.0168	0.0013	0.0669

GLM, growth language mindset; CF, cognitive flexibility; SE, school engagement.

The results revealed that a growth language mindset positively predicted both cognitive flexibility ($\beta = 0.1154$, $p < 0.01$) and school engagement ($\beta = 0.1580$, $p < 0.01$) in EFL learners. Cognitive flexibility also emerged as a significant positive predictor of school engagement ($\beta = 0.2418$, $p < 0.05$). Furthermore, in addition to the direct path from “growth language mindset → school engagement”, the growth language mindset also exerted a significant indirect effect on school engagement through cognitive flexibility ($\beta = 0.0279$, 95% $CI = [0.0013, 0.0669]$), as displayed in **Figure 2**.

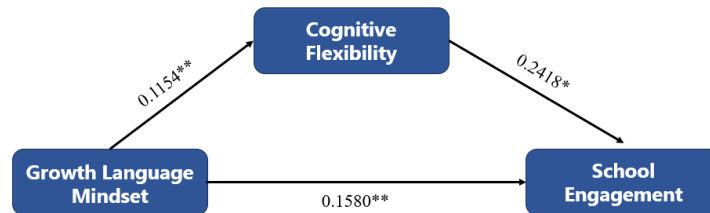


Figure 2: The path diagram and coefficient. * $p < 0.05$, ** $p < 0.01$

4. Discussion

Previous research has established that both a growth language mindset and cognitive flexibility independently contribute to students’ sustained engagement in the learning process. However, the interactive effects of these factors on school engagement among EFL learners remain underexplored. The present study aimed to investigate the complex interplay between a growth language mindset, cognitive flexibility, and their joint influence on EFL learners’ school engagement. The findings indicated that both the growth language mindset and cognitive flexibility were significant predictors of school engagement. Furthermore, a growth language mindset was found to influence school engagement indirectly, through the mediating role of cognitive flexibility.

4.1 The Influence of Growth Language Mindsets on School Engagement

The current study demonstrated a strong association between a growth language mindset and EFL learners’ school engagement. Moreover, the findings indicated that the stronger learners’ belief in the capacity to enhance language ability through effort and perseverance, the higher their level of school engagement in the learning process. It was in line with previous research which stated that language learners who exhibited a growth language mindset demonstrated a greater capacity to regulate their thoughts, navigate challenges effectively, and sustain motivation in engaging with learning tasks^[19].

A possible explanation may be that EFL learners who endorse a growth language mindset are more likely to perceive challenges and setbacks as opportunities for self-development rather than as insurmountable obstacles, fostering resilience and persistence^[20]. This kind of language mindset encourages individuals to dedicate more time and effort to their learning activities. Additionally, structural equation modeling analyses revealed that a growth language mindset could reinforce

positive emotions or reduce negative emotions experienced during the learning process, promoting a higher level of learners' school engagement ^[21].

4.2 The Mediating Role of Cognitive Flexibility

It was also revealed that cognitive flexibility was positively related to EFL learners' school engagement. Furthermore, cognitive flexibility was found to play a critical role in enhancing learners' engagement in learning activities. These results supported previous findings indicating that cognitively flexible students were more willing to invest time and effort in school activities and learning tasks ^[22]. Students with a higher level of cognitive flexibility would exhibit a stronger adaptive capacity and maintain a positive attitude toward challenges and difficulties encountered during the learning process ^[23], leading to more engagement.

Further mediation analyses indicated that cognitive flexibility mediated the relationship between a growth language mindset and EFL learners' school engagement. This suggested that, in addition to its direct effect, a growth language mindset influenced school engagement indirectly through cognitive flexibility. This finding offered empirical support for a complex mechanism underlying the relationship between a growth language mindset and school engagement. The realization of the pathway of "growth language mindset → cognitive flexibility → school engagement" could be explained that EFL learners who endorsed a growth language mindset would be more cognitively flexible and they were more likely to regard learning tasks or challenges as opportunities for personal and academic development. This perspective encouraged them to take positive actions and deliberate effort in learning. Grote highlighted the parallels between a growth language mindset and cognitive flexibility in his research, suggesting that it was crucial for language acquisition to foster the development of cognitive flexibility and the cultivation of a growth language mindset ^[24].

5. Conclusions and limitations

The current study examined the complex relationships among EFL learners' growth language mindset, cognitive flexibility, and school engagement. The results indicated that both growth language mindset and cognitive flexibility significantly contributed to enhancing EFL learners' school engagement. What's more, a growth language mindset was found to influence EFL learners' school engagement both directly and indirectly, with cognitive flexibility serving as a mediating factor. These findings underscored the importance of fostering a growth language mindset and cognitive flexibility in promoting greater school engagement among language learners. Consequently, teachers could consider implementing relevant strategies to cultivate these attributes, promoting higher engagement in language learning.

This study acknowledges several limitations, accompanied by recommendations for future research. First, the sample size was small and relatively constrained, which may limit the generalizability of the findings. Further study could validate and extend the findings of this study within more diverse language learning groups. Second, the current study focused exclusively on the growth language mindset, neglecting the fixed language mindset. Future research could examine the effects of both kinds of language mindsets and even the mixed language mindset. Finally, the present study investigated the influence of a growth language mindset on school engagement through the mediating role of cognitive flexibility. More underlying mechanisms are waiting for exploration.

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