ORIGINAL ARTICLE

Unpacking the Association Between Growth Mindset, L2 Grit, Conscientiousness, and Foreign Language Performance in a Chinese EFL Context

Hong Shi ⬤ | Wei Sun ⬤

China University of Petroleum, Beijing, China

Correspondence: Hong Shi (shihong2005sd@163.com)

ABSTRACT

Growth mindset and academic perseverance (i.e., conscientiousness and grit) are well-established predictors of academic performance. Nevertheless, a paucity of research delves into the combined effects of these variables in predicting English as a foreign language learners' foreign language performance (FLP). This study, therefore, aims to elucidate the predictive effects of a growth language mindset on FLP with a particular emphasis on exploring the mediating mechanisms of language-specific conscientiousness and L2 grit. Data were collected from a sample of 209 middle school students in Southwestern China, who completed questionnaires and an English test. The findings derived from the structural equation modeling unveiled that growth language mindset exhibited positive and significant direct as well as indirect predictive effects on FLP. In addition, L2 grit and language-specific conscientiousness were found to partially co-mediate the link between growth language mindset and FLP. Importantly, the study extends existing literature by emphasizing that academic perseverance, namely, L2 grit and language-specific conscientiousness, are malleable behaviors shaped by a growth language mindset within the specific contexts of language learning, rather than being fixed personality traits. Pedagogical implications and suggestions for future research were then provided.

摘要

成长型思维模式和学业毅力 (即尽责性和坚毅) 是公认的学业成绩预测因素。然而, 鲜有研究深入探讨这些变量在预测英语作为外语学习者外语成绩方面的综合效应。因此, 本研究旨在阐明成长型语言思维模式对外语成绩的预测作用, 尤其关注语言特定尽责性和二语坚毅的中介机制。数据来自中国西南部209名中学生的样本, 他们完成了问卷和英语测试。结构方程模型的结果显示, 成长型语言思维模式对外语成绩具有显著且积极的直接和间接预测作用。此外, 研究发现二语坚毅和语言特定尽责性在成长型语言思维模式与外语成绩之间起到部分共同中介作用。本研究强调学业毅力 (即二语坚毅和语言特定尽责性) 是在语言学习的特定情境下由成长型语言思维模式塑造的可塑行为, 而非固定的人格特质, 是对现有研究的进一步拓展。最后, 本研究提出了教学启示和未来研究的建议。

1 | Introduction

Acquiring a second or foreign language (L2) is an enduring and arduous journey replete with moments of failure and discouragement (Botes et al. 2024a; Khajavy et al. 2021a). However, growth-mindset learners view these setbacks as integral to language learning, which prompts them to exert more effort in their L2 acquisition endeavors (Lou and Noels 2016). Thus, the trajectory of second language acquisition (SLA) necessitates the pivotal role of growth mindset, which entails the malleable nature of intelligence that can be enhanced by effort and perseverance (Lou and Noels 2016; Mercer 2012). Research suggests that interventions aimed at fostering a growth language mindset can lead to improved language learning outcomes (Fathi and Hejazi 2024; Fathi et al. 2024a, 2024b; Lou and Noels 2016). This is especially relevant in Eastern Asian contexts, such as China, where Confucian-heritage culture places a strong emphasis on effort as a key to success (Bai et al. 2021). In these cultural settings, promoting a growth language mindset may have a unique and profound impact on students' language learning experiences (Bai et al. 2021; Hu et al. 2022).

Closely related to growth mindset, grit endows learners with "a passion and perseverance to accomplish long-term goals whatever the obstacles and no matter how long it may take" (Duckworth et al. 2007, 541). Recent research has shown that learners who believe in the malleability of their English as a foreign language (EFL) learning ability are grittier in the learning process (Khajavy et al. 2021a; Sadoughi and Hejazi 2023; Tang et al. 2019). This personality trait holds equal significance to talent in determining student success, providing additional predictive value for achievement beyond natural ability (Duckworth et al. 2007). Apart from demonstrating resilience in the face of setbacks, gritty L2 learners are unwaveringly dedicated to a sustained and long-term aim (Sun et al. 2024; Teimouri et al. 2022a, 2022b), which thus facilitates their foreign language performance (FLP; Botes et al. 2024a; Fathi and Hejazi 2024; Khajavy 2021; Sudina and Plonsky 2021; Teimouri et al. 2024).

In the same vein, learners who embrace a growth mindset are more inclined to confront challenges with self-discipline and conscientiousness, thus exhibiting greater perseverance (West et al. 2016). As a fundamental element of academic perseverance (Farrington et al. 2012), conscientiousness refers to "dependability and will to achieve" (Poropat 2009, 322). Distinct from grit, which focuses on one's long-term passions and endeavors, conscientiousness only underscores effort and self-control toward relatively short-term goals (Teimouri et al. 2022a). Conscientious individuals resist distractions and impulses, ensuring their dedication to continuous learning and hard work (Furnham et al. 2003; Teimouri et al. 2022a). Compared with the other elements of the Big Five Personality, conscientiousness exhibits a stronger link with academic performance (Credé et al. 2017; Sudina and Plonsky 2021). In response to Botes et al.'s (2024b) call for further research on the impact of personality traits in L2 learning, this study focuses on the significant yet underexplored trait of conscientiousness among Chinese EFL learners (Xu et al. 2024).

Although a wealth of evidence-based research has confirmed these associations in the field of general psychology (e.g., Poropat 2009; West et al. 2016), there is a noticeable scarcity of empirical evidence regarding this particular aspect in SLA. Additionally, it is still uncertain how a growth language mindset predicts FLP through the mediation of academic perseverance (i.e., L2 grit and conscientiousness), especially among Chinese middle school students. This study intends to address the research gaps by building upon Farrington et al.'s (2012) theoretical framework on non-cognitive factors. The framework highlights how these non-cognitive factors differ from cognitive ones, such as students' content knowledge or academic skills, which are typically measured by IQ tests and school-administered exams. Non-cognitive factors extend beyond a narrow focus on skills, encompassing strategies, attitudes, and behaviors that influence student performance. They also account for how students "interact with the educational context within which they are situated and the effects of these interactions on students' attitudes, motivation, and performance" (Farrington et al. 2012, 2). The framework identifies a reciprocal relationship between academic mindset, academic perseverance (a higher-order construct encompassing grit and conscientiousness, among others), academic behaviors, and academic performance. It is highlighted that the modification or adjustment of a positive academic mindset in specific contexts can enhance students' inclination to exhibit academic perseverance, ultimately leading to improved academic performance.

Taken together, this study extends Farrington et al.'s (2012) framework in SLA by proposing a mediation model that investigates how L2 grit and conscientiousness act as mediators in the link between growth language mindset and FLP. It is also among the pioneering studies to explore the mediation of academic perseverance in the association between growth language mindset and FLP in the Chinese EFL context. By broadening the research scope on the association between motivational and personality factors, this study could yield valuable theoretical and pedagogical insights into leveraging EFL learners' language mindset and academic perseverance as positive influences on language learning (Teimouri et al. 2022a, 2022b).

2 | Literature Review

2.1 | Theoretical Framework

This study is framed within the non-cognitive factors model outlined by Farrington et al. (2012). This model identifies several non-cognitive factors crucial for student achievement, particularly focusing on academic perseverance, academic behaviors, and academic mindsets. The relevance of this model lies in its capacity to address both the direct and mediating effects of these traits on academic performance. Specifically, growth mindset not only has a direct effect on academic performance but also influences outcomes through the mediation of grit and conscientiousness, as these traits enhance perseverance and goal-directed behaviors (Farrington et al. 2012). Applying this framework to the context of EFL learning in China, this study investigates how these non-cognitive traits—growth language mindset, L2 grit, and conscientiousness—interact to predict FLP.

Academic perseverance, central to this framework, refers to "a student's tendency to complete school assignments in a timely and thorough manner, to the best of one's ability, despite distractions, obstacles, or level of challenge" (Farrington

et al. 2012, 9). This concept encapsulates elements of grit and conscientiousness—two stable personality traits that are often linked to FLP (Sudina and Plonsky 2021). However, if grit and conscientiousness are defined as a type of academic perseverance that corresponds to a student's perseverant behavior in a particular learning situation, such a learner-internal characteristic is malleable regardless of one's personality and potentially amenable to intervention (Farrington et al. 2012; Sudina and Plonsky 2021; West et al. 2016). In their framework, Farrington et al. (2012) claim that while one's natural tendency to persist may be difficult to alter, learners can still modify the intensity, direction, and duration of their behaviors regardless of their personality traits. In other words, even if a student is not naturally inclined to be gritty or conscientious, they can learn to behave in ways that exhibit perseverance (McCrae and Costa 1994; Roberts and DelVecchio 2000). In addition, the framework specifically emphasizes academic perseverance, as opposed to perseverance in a broader sense. When viewed in this context, students demonstrate varying levels of perseverance depending on the conditions they face. This suggests that "academic perseverance as a behavior in a specific context is highly malleable" (Farrington et al. 2012, 24). This malleability of academic perseverance supports the hypothesis that a language-specific growth mindset can influence a student's perseverance (i.e., grit and conscientiousness) in language learning contexts, which is the focus of this study.

2.2 | Growth Language Mindset and FLP

Mindsets are individuals' fundamental beliefs concerning the malleability of human abilities, intelligence, and personality (Dweck and Leggett 1988). Given that implicit theories of intelligence (mindset) are believed to be domain specific, the L2 learning context has seen the extension of research on mindsets (e.g., Lou and Noels 2017; Ryan and Mercer 2012; Xu 2022). As noted by Mercer (2012, 22), foreign language mindset "reflects the extent to which a person believes that language learning ability is dependent on some immutable, innate talent or is the result of controllable factors such as effort and conscious hard work." Growth-mindset learners believe in the potential for language learning abilities to be cultivated and improved through hard work, persistent effort, and dedicated practice (Ryan and Mercer 2012). Lou and Noels (2017) contributed to existing research on language beliefs by creating an assessment tool that measures three key dimensions of language mindsets: general language intelligence beliefs (GLB), which assesses whether individuals perceive language intelligence as fixed or capable of development; second/foreign language aptitude beliefs (L2B), which explores beliefs regarding whether their language aptitude is unchangeable or can be enhanced through effort; and age sensitivity beliefs (ASB), which examines whether individuals believe language ability is flexible until a certain age and then becomes fixed, or if they reject the notion of age-related limitations and believe language learning can be successful at any stage of life.

Research on the predictive effects of growth language mindsets on L2 achievement has yielded inconsistent results. For example, in Iranian EFL contexts, growth language mindset has been confirmed as a significant and positive predictor of L2 reading performance (Khajavy et al. 2021b), L2 speaking performance (Derakhshan & Fathi, 2024b), and overall L2 achievement (Fathi

et al. 2024b; Khajavy et al. 2021a; Zhang et al. 2024). Similarly, Elahi Shirvan et al. (2024) conducted a multilevel meta-analysis of 22 studies involving 17,622 participants. Their results indicated that a higher growth language mindset was strongly associated with improved language learning outcomes with no significant variation across factors such as age, proficiency level, or learning context. However, a lack of direct relationship between growth language mindsets and achievement has been observed in other L2 research. For instance, Lou et al. (2022) employed latent profile analysis with 234 first-year Canadian university students and found that growth language mindset alone did not predict L2 grades. Moreover, Teimouri et al. (2024) studied 236 English-major undergraduate students in Iran and found that, although the total indirect effects were statistically significant, a growth language mindset had no significant direct effects on language achievement. Such findings have also been found in the Chinese EFL context (e.g., Cho et al. 2021). Cheong et al. (2023), in a study of 589 Chinese 12th graders, similarly found no direct positive pathway from growth language mindset to writing performance when categorizing students by their writing proficiency (high, middle, and low). Yeager and Dweck (2020) inferred that a growth mindset may not lead to further increases in study hours or test scores when there is already a strong cultural expectation to work hard, as Chinese students reportedly dedicate the second-highest amount of weekly study time worldwide. However, they noted that this does not imply that every sample from such countries would show no effect. Indeed, other studies confirmed this with contrasting findings in the Chinese EFL context. For example, Hu et al. (2022) examined 388 EFL students at a Chinese university and found that growth language mindset positively predicted English language performance ($\beta = 0.31$). More recently, Xu and Feng (2024) studied 479 Chinese college English learners and found that a growth language mindset significantly predicted L2 achievement ($\beta = 0.36$), further suggesting that a growth language mindset can indeed influence language learning outcomes in certain contexts. Taken together, these findings underscore the complexity of the relationship between growth language mindsets and L2 achievement outcomes, highlighting the need for further investigation, especially among younger Chinese L2 learners.

Hypothesis 1. *Growth language mindset positively predicts FLP.*

2.3 | L2 Grit as a Mediator

Grit encompasses the qualities of "perseverance and passion for long-term goals" (Duckworth et al. 2007, 1087). This higher-order personality trait involves two crucial components: perseverance of effort (PE), which signifies an individual's resolute and persistent allocation of energy to sustain a long-term pursuit, and consistency of interests (CI), denoting the ability to maintain unwavering enthusiasm and passion throughout an extended timeframe, regardless of encountered failures, disappointments, or challenges (Duckworth et al. 2007). The significance of grit in students' success has been highlighted by Duckworth et al. (2007), revealing that grittier learners experienced greater success both academically and non-academically. Since the general grit construct has been criticized in terms of its conceptualization, measurement, construct validity, and predictive validity (Li and Yang 2023), researchers have recently shown a keen interest

in exploring the domain-specific construct of grit (L2 grit) in SLA (Botes et al. 2024a; Teimouri et al. 2022a, 2022b), which specifically measures learners' perseverance and determination in acquiring a second language (Sudina and Plonsky 2021).

Though still in its early stages, L2 grit has emerged as a key focus for researchers in the psychology of L2 learning, as they investigate the possible connections between learners' grit and their language learning outcomes (see Demir 2024 for a review). Existing research on domain-specific grit has yielded much evidence supporting the positive link between L2 grit (components) and FLP (e.g., Hu et al. 2022; Khajavy 2021; Mikami 2024; Sudina et al. 2021). Teimouri et al. (2022a) conducted a study with 191 L1-Persian students studying English translation at a private university. The findings revealed that L2 grit was positively related to students' language learning motivation and achievement, outperforming the effects of domain-general grit. In a separate study by Teimouri et al. (2022b), involving 236 English-major university students in Iran, L2 grit was again found to positively predict the students' L2 achievement. More recently, Botes et al. (2024a) studied 182 EFL students in Iran, identifying L2 grit as the most dominant predictor of L2 academic achievement. They concluded that learners with greater interest and perseverance in learning the language tend to achieve higher grades. Teimouri et al. (2024) further confirmed this relationship in their study among 236 Iranian English-major undergraduate students. Similarly, in the Iranian context, Fathi and his colleagues have also supported this link in their research (Fathi and Hejazi 2024; Fathi et al. 2024b). In a recent meta-analysis of 24 studies, Sun and Xu (2024) found a positive moderate relationship ($r = 0.419$) between L2 grit and L2 achievement. However, Alamer's (2021) study produced unique findings regarding the predictive power of grit constructs on later English vocabulary acquisition. They found that while the direct effects of grit constructs at Time 1 on vocabulary learning at Time 2 were not significant, the total indirect effects, mediated through grit constructs at Time 2, proved to be meaningful. In another study, Khajavy and Aghaee (2022) explored L2 grit and its components, examining their relationships with L2 emotions, personal best goals, and FLP among 226 Iranian EFL learners. They found that when grit was considered as the sole factor influencing FLP, albeit only PE exhibited a significant link with FLP. However, when other predictors were included in the analysis, neither component of grit predicted FLP. These diverse findings highlight the need for further research to better understand the relationship between L2 grit and L2 achievement across different contexts (Li and Yang 2023).

In Chinese EFL contexts, Wei et al. (2019) conducted a large-scale study involving 832 Chinese middle school students and found a positive link between L2 grit and FLP. Liu et al. (2022) used a bifactor model to examine the relationship between L2 grit and language achievement among 637 first-year senior high school students in China, discovering that both PE and CI significantly predicted language achievement. Likewise, Li and Yang (2023) studied 289 FL German learners from six secondary schools in China and found much stronger L2 grit–L2 achievement links compared to earlier studies (e.g., Teimouri et al. 2022a). Their findings indicate that for younger L2 learners, L2-specific interest and effort may have a stronger impact on L2 achievement compared to adult learners. Collectively, these studies highlight the

importance of L2 grit in enhancing language learning outcomes among younger Chinese students, which is the primary focus of the present study.

L2 grit is closely linked to learners' growth language mindset (Khajavy et al. 2021a). Growth mindset, as suggested by Dweck (1999), is the belief that abilities and attributes can be developed through hard work and effort. Learners with a growth mindset are driven by mastery-oriented goals, motivating them to persist and maintain their interests despite setbacks, failures, and challenges (Tang et al. 2019). Empirical research has established a positive predictive effect of growth language mindset on L2 grit (Sadoughi and Hejazi 2023). In a study by Teimouri et al. (2022a) involving 191 Persian-speaking students studying English translation at a private university, L2 grit was found to be positively associated with a growth language mindset and negatively associated with a fixed mindset. Similarly, Derakhshan and Fathi (2024a) examined 379 participants from various language institutes in Iran and confirmed that growth language mindset significantly influences L2 grit. Furthermore, Fathi et al. (2024a) utilized a cross-lagged panel design to explore the relationships among 903 EFL learners in Iran, assessed at two different time points. They found that growth language mindset had a significant impact on grit at Time 1, meaning that a stronger growth language mindset was associated with higher levels of grit, but only when both were measured concurrently. The same finding has been drawn in Chinese EFL contexts. Fan et al. (2024), in a study involving 868 young EFL learners from four high schools in China, found that growth language mindset components positively predicted their L2 grit components and that L2B had a stronger predictive power for PE and CI compared to GLB.

In addition, theoretical and empirical evidence suggests that L2 grit may mediate the relationship between growth language mindset and FLP. Growth-mindset language learners, who demonstrate perseverance and eagerness to achieve their goals, view failure as an essential part of language learning and a valuable opportunity for growth (Khajavy et al. 2021a). This perspective can lead to higher FLP (Liu et al. 2022). This mediating role of L2 grit was supported by Hu et al. (2022) in a study of 388 EFL learners at a Chinese university, which found that growth language mindset predicted FLP through the mediation of L2 grit. Similarly, Fathi et al. (2024b) confirmed this mediating role in a study of 379 intermediate EFL learners. Likewise, in the Iranian EFL context, Teimouri et al. (2024) found that the indirect effect of growth language mindset on L2 achievement through L2 grit was statistically significant among 236 English-major students. However, Khajavy et al. (2021a) reported that L2 grit did not mediate the relationship between growth language mindset and FLP. These mixed findings indicate the need for further investigation into the potential mediation mechanism where growth mindset positively influences FLP through L2 grit.

Hypothesis 2. *L2 grit positively predicts FLP.*

Hypothesis 3. *Growth language mindset positively predicts L2 grit.*

Hypothesis 4. *Growth language mindset positively predicts FLP through L2 grit.*

2.4 | Language-Specific Conscientiousness as a Mediator

Conscientiousness is described as "the propensity to follow socially prescribed norms for impulse control, to be goal directed, to plan, and to be able to delay gratification and follow norms and rules." (Roberts et al. 2009, 369). It is widely recognized as being more closely associated with academic performance than other personality traits outlined in the five-factor model (Poropat 2009), which includes agreeableness, openness, extraversion, and emotional stability (Sudina and Plonsky 2021). Conscientious students, as noted by Furnham et al. (2003), are characterized by their hardworking nature, self-discipline, and achievement-oriented mindset, which contributes to their increased ambition and motivation to perform well academically. Chen et al.'s (2022) meta-analysis involving 31 primary studies and a cumulative sample size of 8853 participants identified conscientiousness as one of the strongest factors in predicting FLP. A similar finding was also revealed in Cao and Meng's (2020) study conducted among 555 Chinese EFL university students. According to Roberts et al. (2005), conscientiousness is identified into five principal facets: industriousness, orderliness, impulse control, reliability, and formality. These nuanced components of conscientiousness exhibit varying degrees of association with academic performance, and among them, the industriousness facets emerge as a significant predictor of college students' academic success (e.g., Noftle and Robins 2007). In this study, language-specific conscientiousness is defined as the extent to which learners exhibit diligence, responsibility, and self-discipline in their language learning activities. It specifically focuses on a learner's proactive approach to language learning, characterized by strategic planning, effective task management, sustained focus, resilience in overcoming challenges, and a commitment to academic growth in L2 learning.

Domain-general grit and the Big Five trait of conscientiousness are conceptually distinct constructs. While conscientiousness focuses on being hardworking, grit highlights a person's enduring effort toward long-term goals. Specifically, the stamina associated with grit differentiates gritty individuals from those who are merely hardworking (Duckworth et al. 2007). Additionally, grit encompasses maintaining a passion for long-term objectives, even in the face of challenges and failures, a feature not present in conscientiousness (Datu et al. 2016). Duckworth et al. (2007) also differentiate grit from self-control—a component of conscientiousness—by noting that grit pertains to long-term aspirations, whereas self-control relates more to short-term goals. Industriousness, another facet of conscientiousness, describes individuals who are "hardworking, (…) aspire to excellence, and are persistent in the face of challenges" (Schmidt et al. 2018, 705). Although both industriousness and grit emphasize persistence, the former leans toward work-related commitment, while the latter focuses on long-term goals that are not necessarily work related (Sudina and Plonsky 2021).

However, domain-general grit has frequently been criticized as simply a rebranded and relabeled version of conscientiousness and falls into a jangle fallacy (Credé et al. 2017; Schmidt et al. 2018). However, domain-specific grit, particularly in the context of language learning, appears to be a distinct construct. Teimouri et al. (2022a) supported this view by showing that conscientiousness was not a significant predictor of L2 grit ($\beta = 0.09$). They noted that the 2-item conscientiousness scale used in their study limited the ability to explore the connections between grit and specific facets of conscientiousness, such as industriousness, which are believed to be closely related (Credé et al. 2017; Schmidt et al. 2018). Building on this, Sudina and Plonsky (2021) examined the relationships between L2 grit and industriousness facet of conscientiousness and found that while both PE and CI related to industriousness, the correlations were relatively small to medium ($rs = 0.27-0.36$). Importantly, their results challenge the idea that grit is indistinguishable from conscientiousness and do not support the notion that grit equates to industriousness or proactive conscientiousness, as proposed by Schmidt et al. (2018). They suggested that the discrepancies between their findings and the relationships observed between domain-general grit and conscientiousness may stem from differences in how grit is defined and operationalized, particularly as a language-specific construct. More recently, Botes et al. (2024a) showed that L2 grit significantly outperformed domain-general grit, conscientiousness, and cognitive ability in predicting L2 motivation and engagement, explaining unique variances beyond conscientiousness. In addition, given the high correlation between grit and conscientiousness ($r = 0.763$) and the moderate relationship between L2 grit and conscientiousness ($r = 0.432$), they concluded that the criticism of domain-general grit as indistinct from conscientiousness is less applicable to L2 grit, which can be considered "new wine in new bottles." They advocated that SLA researchers use L2 grit over domain-general grit, thus avoiding the jangle fallacy and adhering to specificity matching principles.

Conscientiousness is closely linked to growth language mindset. Growth-mindset individuals were believed to be more inclined to adapt to unfamiliar circumstances easily and cause noticeable changes in their personality traits (De Vries et al. 2021). Additionally, as suggested by West et al. (2016), growth-mindset learners exhibit a greater inclination to actively pursue challenging academic environments driven by their desire to excel, and this motivation is accompanied by notable levels of self-control and conscientiousness. In a study of 606 English majors at Chinese universities, Xu et al. (2024) found that all three components of the growth language mindset were positively related to conscientiousness. Given that a growth mindset can shape personality development, further research is needed to understand how personality traits like conscientiousness interact with language mindsets to predict L2 learning achievements (Xu et al. 2024). Farrington et al. (2012) noted that growth-mindset learners tend to approach their studies with self-discipline, diligence, and perseverance, leading to better academic performance. Thus, it is plausible that EFL learners with a growth language mindset are self-disciplined and conscientious when learning an L2, which in turn facilitates their FLP. However, the language-specific conscientiousness as the mediator in the link between growth language mindset and FLP receives less attention in SLA.

Hypothesis 5. *Language-specific conscientiousness positively predicts FLP.*

Hypothesis 6. *Growth language mindset positively predicts language-specific conscientiousness.*
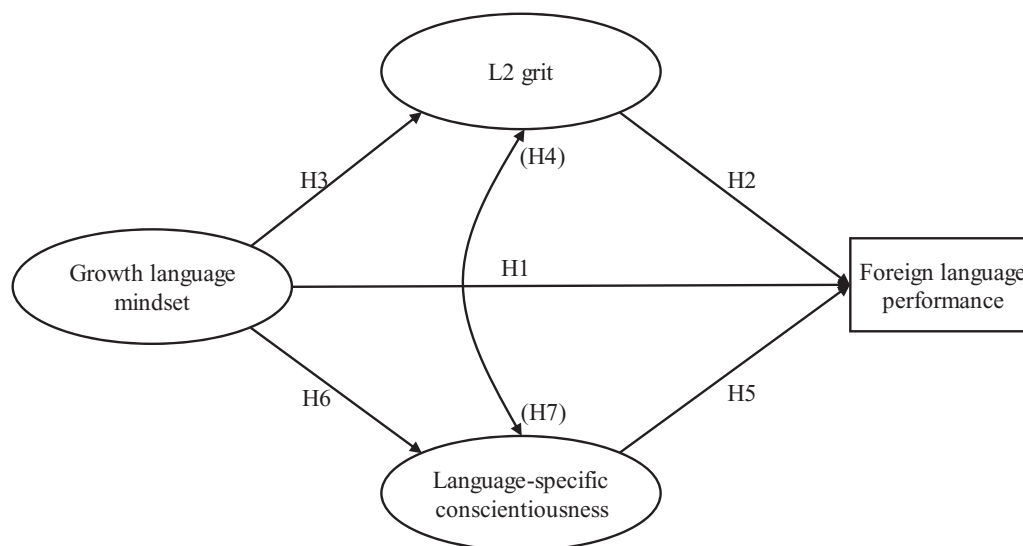
FIGURE 1 | The hypothetical model.

Hypothesis 7. *Growth language mindset positively predicts FLP through language-specific conscientiousness.*

Based on the theoretical underpinnings and related literature, a hypothetical model with seven hypotheses was proposed. As shown in Figure 1, this model depicts the relationships among EFL learners' growth language mindset, L2 grit, language-specific conscientiousness, and FLP.

3 | Methodology

3.1 | Participants

A convenience sampling approach was utilized to select a total of 209 Grade Three students (ages ranging from 14 to 18, $M = 15.25$, $SD = 0.62$) from a middle school in Southwestern China, with a gender distribution of 59.8% females ($n = 125$) and 40.2% males ($n = 84$). All participants in the study were Chinese L1 speakers who acquired English as an L2 and had no prior overseas experiences. The participants' English education adhered to the standardized curriculum established by the Ministry of Education of China, which consisted of ten 40-min English lessons conducted every week.

3.2 | Instruments

The questionnaire used in this study includes the *Growth Language Mindset Scale*, the *L2 Grit Scale*, the *Language-Specific Conscientiousness Scale* (see the Appendix), and basic demographic questions such as gender, age, language proficiency, and overseas experience. For all items, participants were required to indicate their level of agreement on a five-point Likert-type scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Language Mindsets Inventory (Lou and Noels 2017) was adopted to measure EFL learners' growth language mindset. The original 18-item scale was designed to measure both growth and fixed language mindset. In this study, only nine items measuring growth language mindset were selected, including three sub-constructs

with three items each: GLB (e.g., *You can always substantially change your language intelligence*), ASB (e.g., *Everyone could do well in foreign language if they try hard, whether they are young or old*), and L2B (e.g., *You can always change your foreign language ability*). The study demonstrated good reliability for the scale ($\alpha = 0.878$) with GLB ($\alpha = 0.814$), L2B ($\alpha = 0.804$), and ASB ($\alpha = 0.823$).

The 9-item *L2 Grit Scale* (Teimouri et al., 2022) was adopted to measure L2 grit with two subscales: PE (5 items, e.g., *I am a diligent English language learner*) and CI (4 items, e.g., *I think I have lost my interest in learning English*). The study demonstrated satisfactory reliability for the L2 grit scale ($\alpha = 0.838$) with PE ($\alpha = 0.815$) and CI ($\alpha = 0.806$).

The 10-item industriousness component of the conscientiousness scale, originally from DeYoung et al. (2007), was adjusted to suit an EFL context in this study, with an example item being "*I carry out my plans for English learning.*" The study demonstrated satisfactory reliability for the language-specific conscientiousness scale ($\alpha = 0.890$).

The final grades received by the students at the end of the school semester were employed as a measure to evaluate their FLP. The grades were based on a standardized exam intended to assess reading comprehension, listening comprehension, writing, grammar, and vocabulary, with a maximum score of 120. The choice to use course grades as a measure of FLP was guided by previous research showing that course grades are more strongly linked to motivational and personality factors (Arens et al. 2015). Additionally, using course grades as a metric is a common practice in L2 research (Khajavy et al. 2021a).

3.3 | Procedures

To ensure accuracy and quality, the questionnaire underwent a rigorous translation process involving translation from English to Chinese and back-translation to English, followed by a thorough review and assessment by two experts in translation and applied linguistics. This rigorous process helped to verify the accuracy of

TABLE 1 | Validity of measures.

Variables	Statistics	χ^2	df	χ^2/df	CFI	TLI	SRMR	RMSEA [90%CI]
Growth language mindset	ESEM	20.958	12	1.747	0.989	0.968	0.017	0.060 [0.000, 0.101]
L2 grit	ESEM	13.589	12	1.132	0.998	0.993	0.016	0.025 [0.000, 0.077]
Language-specific conscientiousness	CFA	39.900	19	2.100	0.974	0.961	0.030	0.073 [0.040, 0.104]

Abbreviations: CFI, comparative fit index; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual; TLI, Tucker–Lewis index.

TABLE 2 | Correlation coefficient matrix.

Measures	1	2	3	4	5	6	7	8	9
1. Growth language mindset	—								
2. General language intelligence beliefs	0.831***	—							
3. Second/foreign language aptitude beliefs	0.829***	0.561***	—						
4. Age sensitivity beliefs	0.841***	0.520***	0.548***	—					
5. L2 grit	0.331***	0.296***	0.288***	0.248***	—				
6. Perseverance of effort	0.313***	0.259***	0.296***	0.231***	0.848***	—			
7. Consistency of interest	0.254***	0.247***	0.197**	0.193**	0.860***	0.460***	—		
8. Language-specific conscientiousness	0.410***	0.295***	0.344***	0.384***	0.340**	0.280***	0.302***	—	
9. Foreign language performance	0.586***	0.515***	0.496***	0.458***	0.447***	0.379***	0.385***	0.517***	—

Note: ***$p < 0.001$; **$p < 0.01$.

the translation and maintained the quality of the questionnaire for use in the study. Before commencing the research, the consent of the students' parents, headmasters, and teachers was obtained. Before the distribution of questionnaires and tests, students were briefed about the research goals, and their responses were guaranteed to be kept confidential. All students consented to participate in the study. A composite pen-and-paper questionnaire was then disseminated to middle school participants, which sought to obtain their demographic information and measure their L2 grit, growth language mindset, and conscientiousness. The questionnaires were administered during class, followed by an English test two weeks later, after which their answer sheets were gathered for grading and future analyses. For the entire duration of the data collection process, the researchers strictly adhered to the ethical principles throughout the entire process.

3.4 | Data Analysis

The collected data underwent initial examination for normality and outliers using SPSS 26.0, which confirmed its suitability for further analyses. The validation of the measurement models was assessed through confirmatory factor analysis (CFA) and exploratory structural equation modeling (ESEM; Alamer 2022), and the hypothesized model was tested using structural equation modeling (SEM) with maximum likelihood estimation, both of which were conducted using Mplus 8.3 (Muthén and Muthén 2017). The model fit was assessed based on criteria including root mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR) ≤ 0.08, Tucker–Lewis index (TLI), and comparative fit index (CFI) ≥ 0.90 (Kline 2023), and

χ^2/df (Chi-square divided by degrees of freedom) <3 (Tseng and Schmitt 2008). A bootstrap analysis, which involved 5000 samples and bias-corrected 95% confidence intervals, was conducted to examine mediation effects.

4 | Results

The construct validity of the measures was assessed through CFA or ESEM, with the models achieving an acceptable level of fit based on confirmed fit indices as presented in Table 1. Additionally, the correlation analysis results in Table 2 revealed significant relationships among all the constructs. These positive associations allow for subsequent SEM that examined the predictive effects of growth language mindset, L2 grit, and language-specific conscientiousness on FLP. Table 3 presents the descriptive statistics, which demonstrate that all skewness and kurtosis values conform to the acceptable limits of normality (Kline 2023).

The SEM yielded an excellent model fit: $\chi^2 = 436.993$, $df = 366$, $p < 0.01$, $\chi^2/df = 1.194$, CFI = 0.973, TLI = 0.970, RMSEA = 0.030, 90%CI [0.017, 0.041], SRMR = 0.049, explaining 54.6% of the variance in FLP, 20.7% in L2 grit, and 22.6% in language-specific conscientiousness. According to the path analysis results presented in Table 4, it was indicated that growth language mindset has a significant and positive effect ($p < 0.001$) on L2 grit ($\beta = 0.455$), language-specific conscientiousness ($\beta = 0.475$), and FLP ($\beta = 0.426$). Similarly, language-specific conscientiousness ($\beta = 0.252$, $p < 0.01$) and L2 grit ($\beta = 0.239$, $p < 0.01$) were also identified as positive predictors of FLP.

TABLE 3 | Results of descriptive statistics ($N = 209$).

Measures	Mean	SD	95%CI		Skewness	Kurtosis
Growth language mindset	2.899	0.527	2.827	2.971	−0.209	−0.112
General language intelligence beliefs	2.801	0.633	2.714	2.887	−0.060	−0.193
Second/foreign language aptitude beliefs	3.002	0.583	2.922	3.081	0.085	−0.309
Age sensitivity beliefs	2.895	0.681	2.802	2.988	−0.157	−0.432
L2 grit	3.007	0.487	2.941	3.073	−0.144	−0.042
Perseverance of effort	2.891	0.503	2.822	2.960	−0.319	0.373
Consistency of interest	3.152	0.654	3.063	3.241	−0.195	−0.436
Language-specific conscientiousness	2.929	0.543	2.855	3.003	−0.290	−0.309
Foreign language performance	68.455	23.788	65.211	71.698	0.012	−1.192

TABLE 4 | Results of path analysis.

Path relationship	Weight	β	S.E.	C.R.
Growth language mindset → L2 grit	0.377	0.455***	0.075	6.078
Growth language mindset → Language-specific conscientiousness	0.508	0.475***	0.069	6.911
Growth language mindset → Foreign language performance	25.730	0.426***	0.080	5.332
L2 grit → Foreign language performance	17.444	0.239**	0.085	2.808
Language-specific conscientiousness→ Foreign language performance	14.228	0.252**	0.085	2.964

Note: ***$p < 0.001$; **$p < 0.01$.
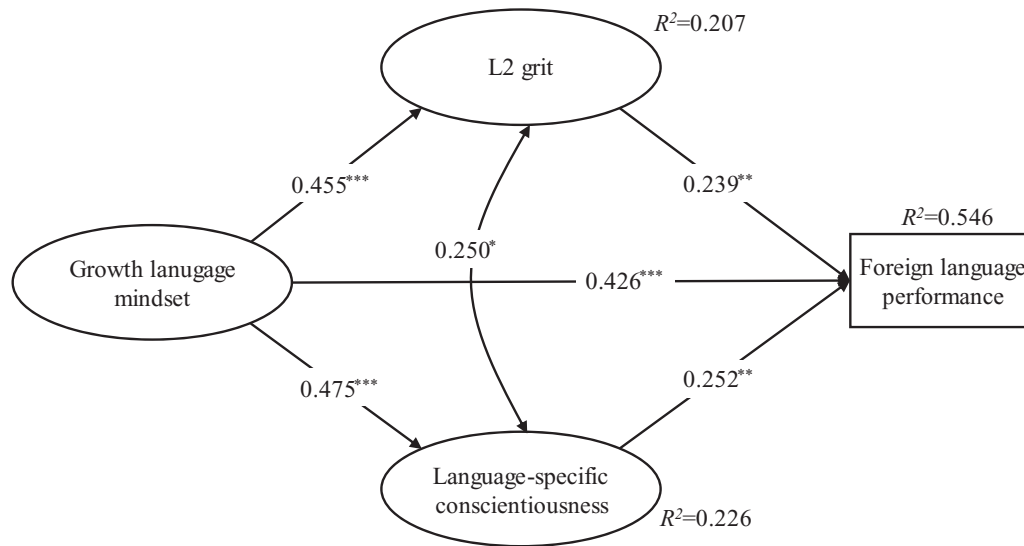
FIGURE 2 | The mediation model. *Note*: ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$.

The results of the bootstrap analysis presented in Figure 2 and Table 5 illustrate a significant and positive link between growth language mindset and FLP (0.655, $p < 0.001$, 95% CI: 0.541–0.752). Moreover, the study identified significant indirect effects of growth language mindset on FLP via L2 grit (0.109, $p < 0.05$, 95% CI: 0.040–0.220) and language-specific conscientiousness (0.120, $p < 0.01$, 95% CI: 0.043–0.207), as indicated by the absence of zero within their respective 95% confidence intervals. Additionally, it was observed that the direct impacts of growth language mindset on FLP were also statistically significant (0.426, $p < 0.001$, 95% CI:

0.263–0.578), without the inclusion of zero in the 95% confidence interval.

5 | Discussion

Our endeavor in this current study was to deepen our understanding of how L2 grit and language-specific conscientiousness mediate the path from growth language mindset to FLP among younger Chinese EFL learners. While aligning with previous

TABLE 5 | Results of mediation effects.

	Weight	β	Boot S.E.	Bias-corrected 95%CI	
				Lower	Upper
Total effects	39.527	0.655***	0.054	0.541	0.752
Direct effects	25.730	0.426***	0.080	0.263	0.578
Indirect effects	13.797	0.228***	0.050	0.142	0.341
L2 grit as the mediator	6.576	0.109*	0.045	0.040	0.220
Language-specific conscientiousness as the mediator	7.221	0.120**	0.041	0.043	0.207

Note:

***$p < 0.001$;

**$p < 0.01$;

*$p < 0.05$.

studies, this research offers unique insights by highlighting the role of these mediators in a high-stakes educational context, such as that of Chinese middle school students.

First, the findings provide strong support for Hypothesis 1, illustrating a positive impact of a growth language mindset on FLP among younger Chinese L2 learners, consistent with prior research (Bai et al. 2021; Elahi Shirvan et al. 2024; Fathi et al. 2024b; Khajavy et al. 2021a, 2021b; Lou and Noels 2016, 2017; Wang et al. 2021). Learners with a growth language mindset typically demonstrate traits such as a sense of belonging, a belief in the effectiveness of effort, confidence in their ability to succeed, and strong engagement in academic tasks, all of which foster perseverance and are crucial for academic success (Farrington et al. 2012). When learners believe they can enhance their English proficiency through their own efforts, regardless of age or circumstances, they tend to exhibit increased motivation and enthusiasm for learning (Xu and Feng 2024). This finding aligns with Dweck and Leggett (1988), who argue that students with growth mindsets view achievements as opportunities to enhance their skills, leading them to engage in challenging tasks and develop effective strategies for success throughout their learning journey. However, the findings of this study contradict some previous research (Lou et al. 2022; Teimouri et al. 2024) that reported no direct effects of growth language mindset on FLP. A possible explanation for these inconsistencies lies in the differing research contexts. Mindset theory primarily addresses responses to challenges or setbacks, and its predictive power on academic outcomes may be more pronounced in high-stakes environments (Teimouri et al. 2024; Yeager and Dweck 2020). In the context of Chinese EFL learning, where high-stakes education is a prominent feature (Bai et al. 2021; Fan et al. 2024), younger learners from rural middle schools may experience amplified challenges, making the predictive power of a growth language mindset more evident. This highlights the unique contribution of the present study, which provides new insights into how growth language mindset affects FLP within this specific educational context. Future research could further explore how such mindsets interact with other socio-cultural factors, such as rural–urban educational disparities, to better understand the full scope of their potential impacts.

Importantly, the unique contribution of the current study lies in its comprehensive exploration of the malleability of academic perseverance, particularly in the context of SLA. Building on Farrington et al.'s (2012) framework, this study highlights that students' perseverance in L2 learning contexts (i.e., L2 grit and language-specific conscientiousness) are not fixed personality traits but malleable behaviors or skills that can be predicted by language-specific mindset. Specifically, the study provides empirical support for Hypothesis 3 that a growth language mindset positively predicts L2 grit. The finding confirms that Chinese middle school EFL learners with growth beliefs about their language abilities tend to exhibit sustained effort and consistent interest in language learning, which are key components of grit (Fan et al. 2024). These learners are also inclined to adopt a malleable view of intelligence (Lou and Noels 2016, 2017) and attribute their failures to insufficient effort (Khajavy et al. 2021a). They perceive challenges and setbacks as valuable opportunities for improving their language skills (Lou and Noels 2017) and actively reflect on their mistakes to enhance their performance (Sadoughi and Hejazi 2023). This observation builds on previous studies (Derakhshan and Fathi 2024a; Fathi et al. 2024a; Teimouri et al. 2022a, 2022b) by highlighting that a growth language mindset not only predicts motivation but also plays a crucial role in shaping learners' perseverance in the face of challenges, thereby enhancing their ability to persist in language learning. As noted by Dweck and Leggett (1988), a growth mindset fosters perseverance and commitment to long-term goals, both of which are crucial for cultivating grit. In addition, these findings also align with Fan et al. (2024) in suggesting that younger participants, particularly in the context of strictly managed learning environments in Chinese middle schools that focus on high examination scores, are more likely to be motivated by growth beliefs and exhibit higher levels of grit, a motivation further influenced by a cultural backdrop shaped by Confucianism that emphasizes the importance of effort (Bai et al. 2021).

Similarly, the positive link between growth language mindset and language-specific conscientiousness, as demonstrated in our findings, provides new insight into how beliefs about the malleability of language proficiency can predict more conscientious language learning behaviors, supporting Hypothesis 6 and aligning with previous research (De Vries et al. 2021; West et al. 2016). EFL learners with a growth language mindset tend to demonstrate greater responsibility for their learning, engage actively in classroom activities, and display stronger self-regulation and time-management skills (Lou and Noels 2016,

2017), resulting in a stronger sense of agency in language learning (Sadoughi and Hejazi 2023). In addition, these findings are consistent with studies (e.g., Xu et al. 2024) that suggest students with growth language mindsets are more self-aware and socially aware, employing better self- and social-management strategies in the L2 learning context. Additionally, this study is among the first to explore the relationship between growth language mindset and domain-specific conscientiousness among Chinese middle school EFL learners. It extends the framework of Farrington et al. (2012) into the field of SLA by demonstrating that conscientiousness, traditionally viewed as a stable personality trait, is malleable and can be shaped by academic mindsets within the specific contexts of language learning.

Moreover, L2 grit was found to be a positive predictor of FLP, supporting Hypothesis 2, and also mediated the relationship between growth language mindset and FLP, supporting Hypothesis 4. Students with a growth language mindset tend to view challenges and setbacks as learning opportunities, which motivates them to persist and manage obstacles effectively, contributing to their academic success (Tang et al. 2019). This finding aligns with Lou et al. (2022), who argued that a growth language mindset influences learning outcomes indirectly by interacting with other motivational components. While prior studies (e.g., Botes et al. 2024a; Fathi and Hejazi 2024; Fathi et al. 2024b; Teimouri et al. 2024) have established these links, this study extends these findings by exploring them within the culturally and educationally distinct context of Chinese EFL education. The results are consistent with Hu et al. (2022), who also found that L2 grit mediates the relationship between growth language mindset and FLP among Chinese university students. In the Chinese EFL context, where there is a strong emphasis on effort, perseverance, and resilience (Bai et al. 2021), grit may play a more prominent role, providing a unique perspective on the dynamics between motivational constructs and language learning outcomes. This stands in contrast to the findings of Tang et al. (2019), who suggested that the impact of a growth mindset on grit might be less pronounced among Finnish adolescent learners. By focusing specifically on the Chinese EFL context, our study provides a possible explanation for this discrepancy. An additional contribution of this study lies in its methodological innovation, which employed a tailored grit measure designed specifically for language learning (Teimouri et al., 2022a, Teimouri et al. 2024). This approach enhances the robustness of the findings and addresses concerns raised by Khajavy et al. (2021a) regarding the limitations of the domain-general grit measure.

Finally, conscientiousness not only positively predicts FLP, providing support for Hypothesis 5, but also mediates the relationship between a growth language mindset and FLP, thus supporting Hypothesis 7. This finding reveals that conscientious EFL learners are more likely to invest effort in improving their FLP, a finding that aligns with existing research (Cao and Meng 2020; Poropat 2009). As noted by Chen et al. (2022), conscientiousness is associated with a variety of beneficial learning behaviors, such as goal setting, effective time management, focused homework practices, and the efficient regulation of effort. These traits enable conscientious learners to excel at self-regulation, planning learning activities, following through on those plans, using metacognitive strategies, and persisting through challenges, which contributes to their success in FLP

(Cao and Meng 2020). Notably, this study is innovative in highlighting the malleable role of language-specific conscientiousness as a mediator between a growth language mindset and FLP. This finding extends Farrington et al.'s (2012) framework into SLA, showing how a growth language mindset fosters conscientious behaviors (e.g., goal setting, self-regulation, and sustained effort) that drive language learning progress. In this way, domain-specific conscientiousness serves not as a stable personality trait but as a dynamic factor that can be shaped by academic mindset (Farrington et al. 2012). As noted by Cao and Meng (2020), learners with a growth language mindset are more likely to adopt conscientious learning strategies, enhancing their FLP through greater persistence and resilience in the face of challenges. This study not only reaffirms the importance of conscientiousness in academic achievement but also offers a new perspective by demonstrating how conscientious behaviors, defined as a component of academic perseverance in language-specific learning contexts, can be cultivated through the development of a growth language mindset (Farrington et al. 2012; Sudina and Plonsky 2021; West et al. 2016).

6 | Conclusions and Implications

By extending Farrington et al.'s (2012) framework into SLA, this study makes a significant theoretical contribution by exploring how growth language mindset predicts FLP among Chinese middle school EFL learners, with L2 grit and language-specific conscientiousness serving as key mediators. It extends existing literature by emphasizing that academic perseverance, namely, L2 grit and language-specific conscientiousness, are malleable behaviors shaped by a growth language mindset within the specific contexts of language learning, rather than being fixed personality traits. The study also highlights the unique role of cultural and educational contexts, particularly in China, where values such as effort and perseverance are emphasized.

The findings have important pedagogical implications for L2 instructors who teach English to middle school students. To facilitate EFL learners' growth language mindset, it is advisable for teachers to provide students with a clear and scientific understanding of the language mechanism in the human brain. For instance, students can be organized to discuss and talk about how the brain works and the malleability of intelligence when learning an L2 (Khajavy et al. 2021a). Furthermore, teachers should cultivate students' competence to make a positive appraisal from setbacks or negative assessments imposed by others, especially in stress-fueled, examination-oriented learning background. Teachers are encouraged to give objective and constructive comments with tenderness, care, and encouragement to foster students' self-efficacy and self-esteem rather than strictly and stressfully criticizing for their drawbacks. Above all, teachers are suggested to praise and inspire students for their hard work instead of their innate intelligence and competence when they make progress in language performance (Hu et al. 2022). In terms of the mediating role of L2 grit, teachers can provide students with examples of successful language learners, enabling them to develop resilience and overcome obstacles by following the footsteps of these inspirational figures. In addition, it is conducive if instructors design challenging tasks involving continuous efforts, which are then assigned to students with incentives. Students are thus motivated

to step out of their comfort zone and persist against challenges through hard work, which in turn would increase grit. To enhance students' conscientiousness in language learning, instructors can utilize incentive-oriented formative evaluation methods to inspire students to prioritize their learning process. This can be achieved by implementing a comprehensive assessment system that considers various learning standards such as patience, concentration, industriousness, self-regulation, responsibility, and strategies. By emphasizing these aspects, students are encouraged to pay closer attention to their daily behaviors and details, fostering the development of excellent learning habits. Moreover, it is beneficial for instructors to receive training and acquire psychological knowledge to effectively conduct structured face-to-face coaching interventions (Martin et al. 2014). By possessing these skills, teachers can better understand and enter students' inner worlds through meaningful conversations and interactions, allowing them to provide appropriate solutions that promote and enhance students' conscientiousness. It is recommended that teachers have a mastery of basic skills and flexible strategies to facilitate this process effectively.

It is crucial to recognize that this study has some limitations. First, only the grades of the final examination were utilized to measure L2 learners' language performance. Future research should examine the various components that contribute to grades to assess the degree to which these grades reflect validated measures of proficiency compared to non-proficiency-based indicators, such as attendance, participation, and assignment completion (Brown et al. 2018). Second, this study employed a convenience sampling technique and participants were limited to one middle school context, which poses limitations to the representativeness of the sample and, as a result, may hinder the generalizability of the findings. To draw a more comprehensive and accurate conclusion, future research could consider extending the sample to involve participants from different schools, and potentially even from different regions. Third, a cross-sectional design was employed in this study and it would be advantageous to utilize a longitudinal research design to obtain a thorough comprehension of the mechanisms and dynamics among variables.

Ethics Statement

Conflicts of Interest
The authors declare no conflicts of interest.

Data Availability Statement
The author confirms that all data generated or analyzed during this study are included in this published article.

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Appendix

Growth Language Mindset (Lou and Noels 2017)

General language intelligence beliefs (GLB):

1. No matter who you are, you can significantly change your language intelligence level.

2. You can always substantially change your language intelligence.

3. No matter how much language intelligence you have, you can always change it quite a bit.

Second language aptitude beliefs (L2B):

1. You can always change your foreign language ability.

2. In learning a foreign language, if you work hard at it, you will always get better.

3. How good you are at using a foreign language will always improve if you really work at it.

Age sensitivity beliefs about language learning (ASB):

1. Everyone could do well in foreign language if they try hard, whether they are young or old.

2. How well a person learns a foreign language does not depend on age; anyone who works hard can be a fluent speaker in that language.

3. Regardless of the age at which they start, people can learn another language well.

L2 Grit (Teimouri et al. 2022a)

Perseverance of effort (PE):

1. I am a diligent English language learner.

2. When it comes to English, I am a hard-working learner.

3. Now that I have decided to learn English, nothing can prevent me from reaching this goal.

4. I will not allow anything to stop me from my progress in learning English.

5. I put much time and effort into improving my English language weaknesses.

Consistency of interest:

1. My interests in learning English change from year to year.

2. I think I have lost my interest in learning English.

3. I am not as interested in learning English as I used to be.

4. I was obsessed with learning English in the past but have lost interest recently.

Language-Specific Conscientiousness (Adapted From DeYoung et al. 2007)

1. I carry out my plans for English learning.

2. I finish the English learning plan I start.

3. I get English assignments done quickly.

4. I always know what I am doing in English courses.

5. I waste time instead of practicing my English.

6. I find it difficult to get down to studying English.

7. I often mess up my English assignments.

8. I don't put my mind on the English task at hand.

9. I postpone my English assignments.

10. I am easily distracted when studying English.