E-ISSN: 2981-1686

Journal of Studies in Language Learning and Teaching

www.jsllt.yazd.ac.ir

JSLLT, Vol. 2, No. 2, 19–32.

Paper Type: Original Article

Metacognitive Awareness of Reading Strategies as a Sequential Mediator between Reading Self-Efficacy, Reading Enjoyment, and Reading Comprehension: A Serial Mediation Model

Zahra Bayat [1,*], Mohammad Davoudi[2]

[1] Department of English Language, Faculty of Literature and Humanities, Hakim Sabzevari University, Sabzevar, Iran;
[2] SabzevarLiterature and Humanities, Hakim Sabzevari University, Sabzevar, Iran.

Received: 18 September, 2025 Revised: 21 January, 2026 Accepted: 07 March, 2026

Abstract

Reading comprehension is an important skill for English as a foreign language (EFL) learners, but developing that skill requires elaborate methods and incorporates numerous levels of cognitive and affective influences. This study employs a novel SEM (Structural Equation Modeling) approach to examine how the metacognitive awareness of reading strategies (MARS), reading self-efficacy (RSE) and reading enjoyment (RE) promotes reading comprehension development for EFL students in Iran. The data were collected from a sample of 600 Iranian EFL learners with a quantitative design based on the MARS Inventory, RSE Questionnaire, RE Questionnaire, and a standardized Reading Comprehension Test. The data were recorded and analyzed with AMOS version 24 and MLE (Maximum Likelihood Estimation). It was shown that metacognitive awareness is a significant mediator for the effect of self-efficacy on reading comprehension, while enjoyment induces changes in self-efficacy and comprehension outcomes. Given the results, it was important to discuss the prominence of instilling metacognitive strategies and aspects of enjoyment in reading practice to influence reading comprehension in EFL educational settings. Regarding the implications for practical applications in the realm of education, this research highlights the key psychological pathways through which learners' beliefs and emotions shape performance and suggest practical directions for designing strategy-based, enjoyment-enhancing reading instruction in similar EFL contexts.

Keywords: Metacognitive awareness of reading strategies, Reading self-efficacy, Reading enjoyment, Reading comprehension, EFL learners.

I | INTRODUTION

Learning to read is no longer only about identifying words; it involves the cognitive, affective, and behavioral processes that an individual has to put together to comprehend a text (Clark & Teravainen, 2017). Metacognitive knowledge and self-regulating tactics are at the center of this complicated skill, giving readers the capacity to be involved in their learning process and to control it (Bagci & Unveren, 2020; Flavell, 1979). Reading self-efficacy, the belief that one can successfully comprehend texts, complements these elements by strongly influencing readers' confidence and persistence. Together, these three constructs determine the extent and depth of readers' engagement with reading texts (Hayat et al., 2020). Despite a lot of research on each of these constructs, the exact position of metacognitive awareness, reading self-efficacy and enjoyment of reading as one of the pathways leading to reading comprehension is still unclear, particularly with EFL learners (Shehzad et al., 2019; Zhou & Zhang, 2025).

Corresponding Author: bayat.zahra.1988@gmail.com

Cite this article: Bayat, Z., Davoudi, M., (2026), Metacognitive Awareness of Reading Strategies as a Sequential Mediator between Reading Self-Efficacy, Reading Enjoyment, and Reading Comprehension: A Serial Mediation Model, *Journal of Studies in Language Learning and Teaching*, 2(2), 19-32. doi:10.22034/jsllt.2026.23680.1095

Reading competence begins with processing written information through the reader's attention and decoding skills. The application of these foundational processes results in meaning construction and higher-order cognitive processing, making reading a mature skill that triggers numerous cognitive processes (Bagci & Unveren, 2020; Kim et al., 2025). Metacognition serves as the cornerstone of effective learning processes because learners need to know their strengths and weaknesses to their reading skills. With the advancement of metacognitive awareness of reading (MARS), the whole idea changes for pupils and controls their own learning activities, thus enabling more active and self-directed learner activities (Bagci & Unveren, 2020; Kim et al., 2025; Teng, 2025; Wei et al., 2025).

Furthermore, self-efficacy also becomes a significant predictor of reading comprehension (Hayat et al., 2020; Shehzad et al., 2019; Zarei, 2018). Self-efficacy is defined as the individual's beliefs about his or her ability to perform a given task and produce desired results (Bandura, 1977). Evidence has consistently demonstrated that students with high reading self-efficacy (RSE) levels are more successful at dealing with and responding to the demands placed on them while reading (Hayat et al., 2020). This sense of self-efficacy shapes not only the level of the effort and persistence students invest in reading tasks but also their emotional reactions when facing reading-related frustrations. Moreover, reading enjoyment (RE), as the pleasure derived from reading particular texts or text types, is a key factor that motivates individuals to read and achieve comprehension. The relationship is particularly evident in the context of students' scholarly careers, since it results in ongoing engagement with reading texts (Dadandı & Dadandı, 2022; Rogiers et al., 2020; Smith et al., 2012).

A systemic review of the earlier research identifies the contribution of both RSE (Cai & Zhao, 2023; Shehzad et al., 2019; Zhou & Zhang, 2025) and MARS (Gajria & Jitendra, 2016; Hayat et al., 2020; Juhkam et al., 2023; Kim et al., 2025; Wei et al., 2025) to reading comprehension. However, it is worth noting that previous research has so far tended to overlook the status of RE and the intricate interconnections between such variables, which are being analyzed here. The current trends in scholarship have witnessed metacognitive strategies and RE being analyzed in isolation or in a dyadic configuration, thus overlooking the synergy potential that could be unlocked through a more integrated approach. Therefore, the previous research has a significant gap regarding the interplay of these key factors and their collective impact on reading comprehension, particularly among EFL learners.

To bridge the mentioned gap, the current project investigates the complex interaction among MARS, RSE, RE, and reading comprehension of EFL students in educational settings. To formulate the theoretical foundation for the study, it is necessary to consider the conceptualization of reading with three primary dimensions including a) cognitive processes involving comprehension as well as technical skills, b) affective processes involved in the interest-related aspect of reading, c) and behavioral processes involving self-regulatory strategies and the emotional side of reading. This method implies that reading proficiency is inextricably intertwined with affective aspects such as RE, reading attitude, reading motivation, reading confidence, and RSE (Clark & Teravainen, 2017). Additionally, the model of metacognitive monitoring proposed by Flavell (1979) categorizes metacognition into four distinct types including strategy or action, metacognitive knowledge, tasks and goals, and metacognitive experiences. This model predicts that a broad spectrum of intellectual behaviors may be effectively regulated through the interaction of the four factors (Flavell, 1979; Moritz & Lysaker, 2018). In conclusion, this study bridges the research gap in how MARS, RSE, and RE all contribute to reading comprehension among EFL learners. By integrating cognitive, affective, and behavioral aspects, it enhances understating of their interaction in reading development.

II. REVIEW OF THE LITERATURE

Reading comprehension involves the cognitive, affective, and behavioral processes that individuals must integrate to construct meaning from texts (Clark & Teravainen, 2017; Bagci & Unveren, 2020). It begins with processing written information through attention and decoding skills, leading to meaning construction and higher-order cognitive processing (Bagci & Unveren, 2020; Kim et al., 2025). Reading strategies are deliberate, self-regulating tactics such as previewing, questioning, and monitoring that enable active engagement with texts (Flavell, 1979; Bagci & Unveren, 2020). This section examines how metacognitive awareness, reading self-efficacy, and reading enjoyment interact with these foundations to influence reading comprehension among EFL learners.

2.1 Role of metacognitive awareness of reading strategies in reading comprehension

Metacognitive awareness is critical in reading comprehension procedures, where it is the knowledge of the cognitive processes and reading strategies employed to make learning achievements. Metacognition has two major components classified by Flavell (1979), i.e., metacognitive knowledge, referring to knowledge of different learning strategies, and metacognitive regulation, referring to the implementation of the strategies. This dual model plays an essential role in evaluating how students regulate cognitive processes to advance reading comprehension. Amini et al. (2020) found that metacognitive strategy awareness is associated with reading comprehension, with self-regulation as the mediating variable in this relationship. This suggests that successful application of metacognitive strategies has the capacity to accelerate reading performance among students. Similarly, Cai and Zhao (2023) established a mediating role of self-efficacy within the relationship between achievement and metacognitive strategies and that both variables are required to predict academic achievement within English language learning environments.

Yet, there are other studies that yield contradictory findings. For example, Immink (2023) conducted an experimental mixed-methods approach and determined no relationship between reading comprehension achievement and metacognitive awareness. This points to the variability and intricacy of these relationships and deserves ongoing investigation into the interaction between metacognitive awareness and cognitive and affective constructs in reading. As Arianto and Hanif (2024) established, both metacognitive and self-regulated strategies enhance positive impacts on problem-solving capacity and self-efficacy for primary school students, but no associative effect was determined between the two strategies. This would mean that learners may oppose the use of these strategies in learning, due to their knowledge styles and experiences; therefore, a detailed examination of these features is required.

2.2 Role of reading self-efficacy in the field of reading comprehension

In the context of language instruction, a meta-analysis investigated the effects of four reading strategies, namely scaffolding, graphic organizers, interactive read-aloud and leveled questioning, on reading comprehension among EFL learners (Li et al., 2024). The findings indicated that all the reading strategies positively influenced comprehension, with even more powerful effects when used together. Moreover, longer intervention durations significantly improved the reading scores of EFL students (Li et al., 2024). In 2023, Al-Khresheh assessed the MARS of Saudi EFL learners and examined the effect of the strategies on reading comprehension. The findings indicated a moderate level of metacognitive awareness, which was linked to reading comprehension performance. In addition, Alamer and Alsagoafi (2023) re-examined the validity of the MARSI and concluded that problem-solving strategies were the most common among EFL learners, showing an apparent preference for those strategies that solve comprehension problems head-on. The researchers confirmed that the degree of motivation was very significant as a mediating variable between reading skills and the use of metacognitive strategies, thus pointing to the relationships among motivation, metacognition awareness, and reading skills.

Hayat et al. (2020) identified appropriate self-efficacy training as the primary source of learners' self-efficacy, which subsequently fosters positive learning-related emotions and the application of metacognitive strategies, ultimately serving as a mechanism to enhance emotional engagement and reading comprehension skills. Shehzad et al. (2019) supported it by demonstrating how RSE beliefs are also strongly associated with reading skill. The relationship between RSE and metacognitive consciousness was also hinted by Zarei (2018), where he found a significant relationship between RSE and the employment of metacognitive strategies and a positive correlation between comprehension and metacognitive reading strategies.

2.3 The interplay of metacognition, self-efficacy, enjoyment, and comprehension in reading

Studies repeatedly stressed the intricate connection among metacognitive consciousness, self-efficacy, RE, and reading comprehension. Klimova et al. (2024) mentioned that metacognitive consciousness significantly contributes to the acquisition of reading comprehension skills by every learner. Further, Boyask et al. (2024) supplemented that affective relationships with reading materials played a major role in promoting engagement since they realized that collaborative reading sessions could strengthen RE and build voluntary reading habits.

The finding underscores the importance of social factors in fostering RE, particularly in EFL contexts. Research has also identified that key RE barriers, such as time pressure and reading-evoked feelings, are

capable of affecting students' engagement (Webber et al., 2024). Knowledge of these factors and strategies to address them can inform more effective instructional approaches to enhance RE and reading comprehension. Mohseni et al. (2020) also found that metacognitive strategy instruction improved overall reading competence with the determination of a link between critical thinking and metacognitive knowledge. Their outputs suggest that a combination of the mentioned factors could form a macro strategy for bolstering RE reading comprehension. Meanwhile, Bagci and Unveren (2020) demonstrated how MARS facilitates perceptions of self-efficacy among reading comprehension in EFL readers, again indicating that metacognitive capacity is necessary for confidence-building in RE and reading competence.

While prior research has extensively examined the separate effects of MARS, RSE, and RE on academic reading skills (Cai & Zhao, 2023; Gajria & Jitendra, 2016; Hayat et al., 2020; Kim et al., 2025; Shehzad et al., 2019; Wei et al., 2025), the part that MARS plays is still not much studied in a novel model. This study tries to fill the stated gap by checking how MARS, RSE, and RE are linked in a setting of learning English as a foreign language. Using a quantitative approach, the present research tries to test the model shown (Figure 1) is right and to help us know more about how these ideas work in teaching English.

The hypothesized paths in Figure 1 are grounded in established theory and empirical evidence from EFL reading research. RSE predicts MARS, as high self-efficacy fosters confidence in deploying self-regulatory strategies per Bandura's (1997, as cited in Hayat et al., 2020) the social cognitive theory, where efficacy beliefs drive deeper cognitive processing and strategy selection. Empirically, Zarei (2018) found significant positive correlation between RSE and MARS use, while Cai and Zhao (2023) demonstrated self-efficacy's mediating role between prior achievement and metacognitive strategies in EFL contexts. MARS, in turn, mediates RSE's effect on RE, as metacognitive regulation enhances task persistence and positive affective responses (Flavell, 1979). Bagci and Unveren (2020) confirmed MARS facilitates self-efficacy perceptions leading to greater RE among EFL readers. RE then mediates the pathway to reading comprehension, sustaining motivation and engagement (Guthrie et al., 2000), supported by Dadandı and Dadandı (2022) who showed RE partially mediates RSE-reading success links. Direct paths from RSE and MARS to comprehension align with meta-analyses (e.g., Shehzad et al., 2019; Hayat et al., 2020) establishing their predictive roles. MARS serves as the primary mediator due to its central position in Flavell's (1979) model, integrating cognitive regulation across affective and behavioral dimensions, as validated in EFL mediation studies (Amini et al., 2020). This serial structure unlocks the synergic effects overlooked in prior didactic research.

Figure 1. The proposed model

This research proposes a mediating model to examine the interplay among RSE, RE, mediated MARS, and reading comprehension, addressing the following research questions:

1) To what extent does MARS mediate the relationship between RSE and reading comprehension?
2) To what extent does RSE influence both RE and reading comprehension, considering the role of MARS?
3) What is the magnitude of the relationships among RSE, RE, MARS, and reading comprehension?

III. METHODOLOGY

The current study adopted a quantitative research paradigm to keep with what Dörnyei (2007) claims regarding quantitative research approaches being well-suited for developing "robust and reliable procedural tools for data collection and statistical modeling." The current research focuses on how MARS, RSE, and RE predict reading comprehension outcomes for EFL learners. It uses statistical modeling, specifically SEM, to analyze the direct and indirect relationships among the mentioned constructs. This approach aims to effectively measure their contributions to comprehension outcomes.

3.1 Participants

The current study involved a sample of 600 Iranian EFL learners who took part in a comprehensive reading proficiency and strategy assessment. The participants were chosen to cover a wide range of demographic profiles, thereby facilitating easy generalizability of findings.

To obtain this diversity, the subjects were selected from different schools, different grades, and genders, as shown in Table 1. Selective sampling based on active enrollment in English language courses and willing collaboration in the evaluation of their reading strategy and capacity was implemented. This ensured a deeper investigation of the relationship between MARS, RSE, RE, and Iranian EFL learners' overall reading comprehension.

The sample comprised 219 males and 381 females, resulting in a gender distribution skewed towards females. At the education level, the participants were distributed over a series of grades, with the largest proportion in Grade 9 (n = 258), followed by Grade 7 (n = 113), Grade 8 (n = 78), Grade 10 (n = 58), Grade 11 (n = 51), and Grade 12 (n = 42).

In order to collect the data, the participants were asked to fill in a set of standardized questionnaires measuring various dimensions of their reading abilities. Among the instruments used was the MARS Inventory, which measures learners' metacognitive awareness and regulation of their reading strategy. For further measuring the participants' self-efficacy in reading ability, the RSE Questionnaire was employed, while the RE Questionnaire aimed to measure their intrinsic motivation and enjoyment obtained from reading activities.

Moreover, the participants took part in a reading comprehension test which was designed in the format of the Oxford Placement Test. This instrument was selected due to its established validity and reliability in assessing reading comprehension among Iranian EFL learners (Wistner et al., 2009). Furthermore, the Reading section of the Oxford Placement Test has evidenced considerable construct validity, as indicated in research reporting significant correlations with other well-established tests of reading ability (Rezaee & Salehi, 2009). Content validity has also been evidenced in expert judgments, to confirm that test items adequately cover important reading comprehension skills (Naqvi et al., 2023). The test has indicated very high coefficients of reliability, with Cronbach's alpha coefficients greater than .80 for various contexts, which suggests its consistency across various administrations (Wistner et al., 2009). Overall, these results lend support to the argument that our Reading Comprehension Test, based on the Oxford Placement Test, is a reliable and valid instrument for assessing reading comprehension ability in EFL learners.

Table 1 presents the demographic characteristics of the participants. It summarizes the participants' demographics, including age categories, gender distribution, and level of formal education. Considering these details, the study examines the relationships among MARS, RSE, RE, and how well these learners understand what they read. This research aims to elucidate the interrelationships among these constructs within the context of Iranian learners of English as a foreign language.

Table 1. The participants' demographic information (n = 600)

Education	Male	Female	Total
Grade 7	41 (36.28%)	72 (63.72%)	113 (18.83%)
Grade 8	26 (33.33%)	52 (66.67%)	78 (13.00 %)
Grade 9	95 (36.78%)	163 (63.22%)	258 (43.00 %)
Grade 10	22 (37.93%)	36 (62.07%)	58 (9.67%)
Grade 11	19 (37.25%)	32 (62.75%)	51 (8.50%)
Grade 12	16 (38.10%)	26 (61.90%)	42 (7.00 %)
Total	219 (36.50%)	381 (63.50%)	600 (100 %)

3.2 Instruments

3.2.1. Reading comprehension test (derived from Oxford Placement Test)

The researchers used a 60-item paper-based reading comprehension test adapted from the Oxford Placement Test (OPT) in a single 45-minute classroom session, featuring 5-6 short passages (10-12 sentences each) with one blank per sentence requiring contextual vocabulary/grammar inference as an indirect reading comprehension measure to assess students' reading proficiency. The OPT is a globally recognized standardized measure of English language abilities. Pilot testing (n = 30) confirmed reliability

(Cronbach's *a* = .85), with content validity established through expert EFL instructor ratings (all = ≥ 4/5), ensuring psychometric robustness for assessing Iranian EFL learners' reading proficiency levels. Its development incorporated the results from pilot testing and the judgements by English language experts.

3.2.2. The MARS Inventory

The MARS Inventory developed by Mokhtari and Reichard (2002) is a self-reporting tool designed to assess people's metacognitive knowledge and the use of reading strategies. It was originally composed of 30 items, which were measured on a five-point Likert scale ranging from "I have never heard of this strategy before" to "I know this strategy quite well, and I often use it when I read". It yields a high-fidelity measurement of the metacognitive knowledge and use of a reader of various reading strategies. The inventory categorizes strategies into three areas: Global Reading Strategies, Problem-Solving Strategies, and Support Reading Strategies, which allow for an in-depth examination of the reading approaches and reader self-regulation processes.

In their 2018 study, the authors conducted a CFA that reduced the items of the tool from 30 to 15. The new MARS Inventory has three parts (five items per subscale): Global Reading Strategies (GRS), Problem-Solving Strategies (PSS), and Support Reading Strategies (SRS). Each part assesses metacognitive awareness during reading. Mokhtari et al. (2018) then validated the reliability and validity of the tool, reporting the internal consistency reliability of .85. Their study confirms the robust psychometrics properties of the MARS Inventory through CFA, yielding a shortened 15-item version that retains its original three-factor structure. The questionnaires took 15 to 20 minutes to complete, reliability was established using Cronbach's alpha on pilot testing, and high values were obtained in terms of internal consistency.

3.2.3 The RSE Questionnaire

To assess the RSE of Iranian EFL learners, Koşar et al. (2022) developed the RSE Questionnaire. It has 16 items with scores from 1 (not at all) to 5 (very well). The items came from ideas by Bandura and Wessels (1994) on making self-help scales for reading. The RSE Questionnaire demonstrated high internal consistency (α = .90) (Koşar et al., 2022). Reliability was estimated to be Cronbach's α = .90 on pilot and main samples, confirming robust internal consistency. It is steady in showing RSE. Zheng (2023) found the questionnaire practical for classroom assessment purposes, helping teachers see where students do well or need more work on their reading.

3.2.4. The RE Questionnaire

For Iranian EFL learners' RE, the researchers adapted a subscale from the Reader Identity Scale developed by Kolb (2014). Specifically, they selected and adapted 16 items focusing exclusively on RE from the original 64-item scale. This adapted subscale had a Cronbach's alpha reliability of .81, indicating acceptable internal consistency for measuring RE among these students. Its construct validity was further supported by CFA, which showed adequate model fit (e.g., CFI-.92, RMSEA = .62).

3.3 Data collection

The data were collected in two consecutive classroom periods in Iranian schools on the same day, where 600 EFL students were given the instruments under the same conditions in each class session: Session 1 included the completion of the MARS, RSE, and RE questionnaires in English-Persian form, about 45 minutes in total. In Session 2, they were given a 60-item reading comprehension cloze test, prepared by OPT, and it took them about 45 minutes to complete. All the questionnaires were administered to the students in a group by trained research assistants, and the students were required to sit individually at their desks. As such, the questions were asked in an organized and standardized manner to ensure the students would give accurate responses.

3.4. Data analysis

At the start, a pilot test was done to assess the reliability and validity of the research instruments, including the MARS List, the RSE Form, the RE Form, and the Oxford Test for reading checks. Thirty Iranian EFL learners participated in this phase. The reliability coefficients (Cronbach's alpha) were high: .85 for the MARS list, .90 for the RSE part, and .81 for the RE section. The participants also provided favorable feedback on the items, confirming the instruments' suitability for the main study.

The main phase of the data analysis commenced once all the data were collected. Using SPSS version 26, simple and link stats were run. This helped show clear results about the learners' sex and schooling

past. First, the key facts were set using numbers to sum up who took part. Next, Path Analysis (PA) was done with AMOS version 24 and Max Chance Guess. This advanced analysis examined the hypothesized model of the study, evaluated its fit to the data, and identified the optimal structure to enhance the result accuracy and validity. The model fit was assessed using indices such as chi-square ($\chi 2$), comparative fit index (CFI), Tucker-Lewis index (TLI), and root mean square error of approximation (RMSEA).

IV. RESULTS

Initially, the Kolmogorov-Smirnov test was employed to check whether the data distribution was normal. The finding pointed out a significance value of .2 for the continuous variable, which is more than the critical value of .05. Thus, the sample data were confirmed to be normally distributed, indicating that they were randomly drawn from a normally distributed population. Consequently, parametric statistical methods were deemed appropriate for this study.

Testing of the three scales yielded certain results. The MARS List has 15 parts. It had a Fit Rate (CFI) of 0.928 and a Fit Score (GFI) of 0.937, with an Error Rate of 0.044. The RSE Form, with 16 parts, got a CFI of 0.936 and a GFI of 0.967, plus an Error Rate of 0.045. Finally, the RE Form, also with 16 parts, showed great fit rates: CFI = 0.981 and GFI = 0.959 with an Error Rate of 0.043. In all, these values show that all the three scales pass the needed marks for a good model fit (Table 2).

Table 2. Validation indices of each scale

Scales	number of items	CFI	GFI	RMSEA
Cut-off Criteria		> 0.9	> 0.9	< 0.05
The MARS Inventory	15	0.928	0.937	0.044
The RSE Questionnaire	16	0.936	0.967	0.045
The RE Questionnaire	16	0.981	0.959	0.043
Total	47			

Note: CFI = Comparative Fit Index; GFI = Goodness-of-Fit Index; RMSEA = Root Mean Square Error of Approximation. Cut-off criteria follow Hu & Bentler (1999): CFI/GFI ≥ .90 acceptable, RMSEA ≤ .05 close fit

According to the descriptive statistics gathered in Table 3, the range of the scores that can be obtained for GRS and PSS is both from 7 to 20, while Support Reading Strategies has a range of 5 to 19. Similarly, the range for RSE and RE is both 16 to 64. For the Reading Comprehension subtest, the minimum score observed is 2, while the score ceiling is 60 for this group of participants.

Surprisingly, the lowest mean (M = 14.83, SD = 2.2) was that of SRS and the highest mean (M = 50.43, SD = 9.2) that of RSE.

Reading strategy analysis indicates that, among all the strategies assessed, the most frequently used was the strategy of "Taking notes while reading" (Strategy 2), as 21.2% of the participants utilized it. Within the global reading strategies category, the "Having a purpose in mind when I read" (Strategy 1) was particularly trendy since 19.5% of the participants used it. Within the problem-solving strategies category, "Re-reading to ensure understanding" (Strategy 14) was the most frequently used strategy since 17.7% of the participants regularly engaged in that practice to confirm their understanding.

Table 3. Descriptive statistics of the sub-constructs of the MARS questionnaire, the RSE questionnaire, the RE questionnaire, and reading comprehension (N = 600)

Sub-constructs	n	Minimum	Maximum	*M*	*SD*
1- GRS	600	7	20	16.03	2.4
2- PSS	600	7	20	16.16	2.3
3- SRS	600	5	19	14.83	2.2
4- RSE	600	16	64	50.43	9.2
5- RE	600	16	64	49.76	9.6
6-Reading Comprehension	600	2	60	51.11	10.26

To answer the first research question, the proposed model was confirmed using the Amos 26 software. As presented in Table 4, the chi-square statistic was .17 ($p < .05$), indicating acceptable model fit. The GFI (.95) and NFI (.93), both exceeded .90, suggesting good fit. Similarly, the IFI (.94) and CFI (.94) demonstrated adequate fit. Additionally, the RMSEA (.04) was below .05, further confirming the acceptable model fit. These results collectively accredit the strength and appropriateness of the model to represent the underlying data structure.

Table 4. Goodness of fit indices

RMSEA	*P*(chi-square)	GFI	NFI	IFI	CFI	
Cut-off criteria	> 0.05	> 0.9	> 0.9	> 0.9	> 0.9	< 0.06
Model	0.171	0.956	0.938	0.941	0.941	0.047

Finally, as indicated in Table 5, the indirect standardized effect of RSE on Reading is estimated at 0.103. This implies that one standard deviation increase in RSE increases Reading by 0.103 standard deviations. Similarly, it is illustrated that the standardized indirect effect of REQ on Reading is 0.062. It implies that a one unit rise in RE raises Reading by 0.062 standard deviations. On the whole, these findings point to the importance of both RSE and RE as extremely good predictors for Reading performance, stressing the interaction effect among the influences within the model.

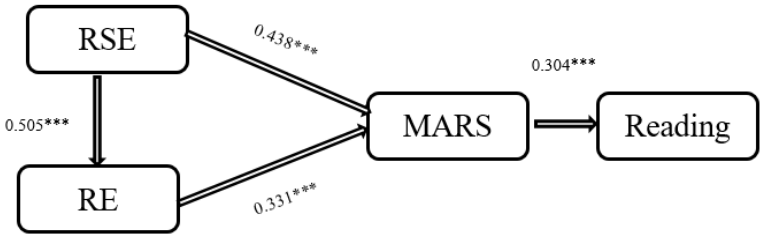

Figure 2. Path analysis results. The path coefficients are presented at standard coefficients. *** < 0.001

Table 5. Path coefficients

Paths Decision		*Beta*	S.E.	C.R.	*p*.value
1- RSE→MARS	0.438	0.023	12.44	< 0.001	Supported
2- MARS→Reading	0.304	0.072	4.23	< 0.001	Supported
3- RSE→MARS→Reading	0.103			< 0.001	Supported
4- RSE→RE	0.505	0.037	14.30	< 0.001	Supported
5- RE→MARS	0.331	0.022	9.39	< 0.001	Supported
6- RE→MARS→Reading	0.062			< 0.001	Supported

A closer examination of the data presented in Table 6 shows that MARS is strongly associated with two main things: RSE with a tie of $r = 0.60$, $p \leq 0.01$ and RE with a tie of $r = 0.55$, $p \leq 0.01$. Also, the data suggest that RSE is close to RE, with a relationship of $r = 0.50$, $p \leq 0.01$. This points out a strong link between the two. There is also an acceptable connection between RSE and reading well, with a tie of $r = 0.30$, $p \leq 0.01$. Conversely, the relationship between MARS and reading proficiency was modest, with a correlation coefficient of $r = .17$, $p \leq 0.01$. This indicates a weak positive association relative to the other correlations observed in this study. Therefore, these points show the deep links among MARS, RSE, RE, and reading well.

Table 6. Correlations of the constructs for the participants (N = 600)

	M	SD	1	2	3	4
MARS	47.03	5.9	-			
RSE	50.43	9.2	0.60**	-		
RE	49.76	9.6	0.55**	0.50**	-	
Reading Comprehension	51.11	10.2	0.17**	0.30**	0.13**	-

** Correlation is significant at the 0.01 level (2-tailed).

To answer the third research question of the size of relationships among MARS, RSE, RE, and reading comprehension, the path analysis shows significant correlations among these constructs (see Table 6). Specifically, RSE has very high positive correlations with both MARS and RE, with path coefficients of 0.438 and 0.505, respectively (see Table 5). This indicates that the students who are more confident in their reading skills tend to have greater MARS and enjoy reading more. Additionally, MARS highly influences reading comprehension supported by a path coefficient of 0.304. RE similarly influences MARS by a value of 0.331. The analysis also shows the indirect effects of RSE and RE on reading comprehension through MARS, at values 0.103 and 0.062, respectively. Overall, this points to the intricate interaction of these constructs, where both RSE and RE must be improved for improved reading comprehension results.

V. DISCUSSION

This study contributes uniquely to the comprehension of the nuanced factors impacting the reading comprehension of Iranian EFL learners. It particularly explains the significance of metacognitive awareness and RE as indispensable elements of the process of reading.

The evaluation conducted in this study provides strong indication that MARS is a good mediating variable in the connection between RSE and reading comprehension. This finding not only confirms but also reinforces the results of earlier research, e.g., Ghaith and El-Sanyoura (2019) and Hayat et al. (2020), which likewise stressed the vital correlation between metacognitive strategy use and other dimensions of academic proficiency, particularly reading ability.

Furthermore, the current study stresses the vital contribution of RE in EFL contexts.

This claim is best evidenced through the engagement model by Wigfield and Guthrie (2000), where it is theorized that motivation is a complex construct made up of various key elements, including RSE and RE. These elements are deemed to be the stable traits that characterize readers and are fundamental in their reading achievement. The findings of the current study are also complemented by Dadandı and Dadandı (2022), whose study emphasizes the significant roles played by both RE and RSE to reading achievement in general. While analyzing the effects of the various variables on one another, it is observed in the study that the mediating effects of RE and RSE on comprehension in reading take place at comparable levels.

Surprisingly, the strongest direct effect noted within this newly proposed model is the connection from RSE to RE. A close second is RSE's unmediated effect on MARS, followed by the impact of RE on MARS. On the other hand, the weakest direct association noted is between reading comprehension and MARS. In addition, the research indicates a strong and positive relationship between MARS and RSE. This is matched by the relationship between metacognitive awareness and RE in a close manner. The interaction between RSE and RE is also found to be significant, but a comparatively weaker relationship between reading comprehension and RSE is experienced. These findings are consistent with previous studies conducted by Immink (2023) and Amini et al. (2020), which also showed a positive correlation between the use of metacognitive strategies and reading achievement.

Moreover, the current study contributes to the understanding of the inter-relationships between MARS, RSE, RE, and reading comprehension of EFL learners. For example, Ebrahimi and Jiari (2023) examined Iranian postgraduate students' attitudes towards reading strategies in poetry and found problem-solving strategies like re-reading are used more frequently than global and support strategies. Taken together, these studies indicate that a balanced method of teaching reading involving both general comprehension skills and genre-specific strategies is necessary. Our study emphasizes the metacognitive awareness role in controlling reading comprehension for EFL readers and suggests that the effective control of cognitive processes is most important to academic success. This stands in contrast to Ebrahimi and Zainal (2018), who found that EFL readers used primarily global strategies to read poems, which can limit their access to challenging texts. The comparison highlights the necessity of instructional practices that enhance metacognitive skills together with a range of reading strategies across genres.

Thus, this study shows that a more advanced level of metacognitive awareness of reading strategies is positively correlated with greater RSE among Iranian EFL learners. Further, the study emphasizes the supreme significance of variables of interest in reading, primarily the RE dimension, in the acquisition of RSE in learning environments focused on EFL instruction. This in-depth consideration highlights the importance of integrating metacognitive strategies with interest-related elements in the EFL learning framework

to produce improved reading outcomes in learners. Specific practices such as reflective reading journals, self-efficacy workshops, and interest-driven reading tasks represent significant advances in pedagogical approaches to enhancing reading proficiency in EFL environments. By this twofold approach (combining metacognitive strategies and interest-related elements), instructors can design more effective teaching practices that address the cognitive and affective sides of reading, which would ultimately lead to improved educational outcomes in reading comprehension among EFL learners.

VI. CONCLUSION AND IMPLICATIONS

This research adds to the literature a better understanding of the complex interrelations between MARS, RSE, RE, and reading comprehension in EFL students. The results point out the complexity of these variables, and the necessity of a multilateral approach to reading instruction. Such a conclusion is imperative for the creation of specific interventions aimed at specific needs in EFL instruction.

The results indicate that metacognitive awareness mediates the relationship between RSE and comprehension. This supports what has been put forward in the literature in that EFL learners who are more aware of their cognitive processes can better regulate their reading strategies. Through the use of metacognitive strategies like self-monitoring and self-evaluating, students can enhance comprehension and overall academic performance, which points to the function of metacognitive awareness in facilitating reading capacity in addition to overall academic capacity.

In addition, the positive correlation of RE and RSE highlights the role of interest in reading. Enjoyment can enhance more engagement and persistence, which is critical for skill development. Students who enjoy reading attack texts positively, which enhances their RSE. Teachers must prioritize making reading enjoyable to develop intrinsic motivation, using diverse and culturally responsive texts to create a context in which reading is viewed as rewarding.

The results of this study have implications for teachers and curriculum planners. A systematic integration of metacognitive strategies in reading instruction is called for. Teachers need to be trained in teaching the strategies with explicitness so that students become more and more aware of their reading process through modeling and practice. Effective training programs that target metacognitive awareness will be the key to offering students consistent guidance toward developing these essential skills.

Moreover, establishing a classroom environment that prioritizes RE is essential. Utilizing various interactive resources and active approaches can accommodate various interests and skill levels. Book clubs, workshops, and literature circles can increase peer-to-peer communication, motivation, and involvement in addition to establishing a reading community that supports each other.

RE and MARS instruction must include extensive training in metacognitive strategies and their implementation in the classroom. Teachers must be trained to apply both RE and MARS for students. Workshops that integrate these strategies and current curricula can prepare teachers to create more effective reading experiences for EFL students.

This research is not without limitations, including the unbalanced grade distribution of the participants. Subsequent studies need to make special efforts in enlisting underrepresented grades to sample more representative EFL students to enhance the generalizability of their findings to varied contexts. Finally, teachers need to provide more diverse collections of material in order to engage students better. Autonomy and freedom in reading materials can make it personalized, which might have beneficial effects in the long run.

Additionally, the cross-sectional design of this study limits causal inferences regarding the interdependencies of the variables. Longitudinal studies are needed to investigate how these interdependencies shift over time and specify more robust causal directions. Researchers must also assess several instructional interventions aimed at enhancing MARS and RE in different educational contexts.

In conclusion, this study emphasizes the most prominent roles of MARS and RE in enhancing RSE and EFL students' understanding. By adopting an integrated approach to reading instruction covering these elements, teachers can contribute to determining students' educational attainment and life-long learning. The findings necessitate educational reforms with particular emphasis on the areas within EFL curricula. While used in Iran, this study has implications for other EFL contexts due to similarity in conditions of

learning languages. Further research needs to examine such dynamics to maximize pedagogy practice geared towards diverse learning groups globally.

If foreign language reading teaching is to be genuinely changed, then educationalists and decision-makers need to accept that developing metacognitive awareness and reading pleasure is not an extra task that can be put aside but the base of successful language learning. This combined approach transforms traditional teaching methods, enabling students to become self-aware and motivated readers who actively apply their reading skills. As a result, they not only improve their academic performance but also enhance their future reading experiences and interactions. They can keep on benefiting from these skills outside the school by applying them in other situations. The adoption of such a comprehensive system could empower EFL learners by transforming reading into a challenging yet intrinsically motivating activity that extends beyond classroom boundaries.

AUTHORS' BIOGRAPHIES

Dr. Mohammad Davoudi is an English faculty member at the Department of English Language and Literature, Hakim Sabzevari University, Iran. Mr. Davoudi got his Ph.D. in applied linguistics with a major focus on psycholinguistics, language teaching, and learning. His research work basically regards such areas as teaching critical thinking in ELT, language socialization, and ethnographic research in language education. He has designed scales of critical thinking, socialization of peers and politeness strategies, language care, and agency role in language learning projects.

Zahra Bayat is a vibrant PhD student at Hakim Sabzevari University, Iran. She is a PhD candidate in the field of English language teaching. As a research lover, she has been so deeply involved in her research on emotion regulation, psychological well-being, and moral disengagement among EFL learners and teachers in Iran. Some of her recent academic contributions have been targeted on the topics such as morality as cooperation in education, teacher-student relationships, language mindset, and cyberbullying in language learning contexts.

REFERENCES

Alamer, A., & Alsagoafi, A. (2023). Construct validation of the revised Metacognitive Awareness of Reading Strategies Inventory (MARSI-R) and its relation to learning effort and reading achievement. *Studies in Second Language Learning and Teaching, 13*(1), 125-149. https://doi.org/10.14746/ssllt.31990

Al-khresheh, M. (2023). A mixed method study on the metacognitive awareness of reading strategies used by Saudi EFL students. *Journal of Pedagogical Research*, *7*(4), 30-47. https://doi.org/10.33902/jpr.202321535

Amini, D., Anhari, M. H., & Ghasemzadeh, A. (2020). Modeling the relationship between metacognitive strategy awareness, self-regulation, and reading proficiency of Iranian EFL learners. *Cogent Education, 7*(1), 1787018. https://doi.org/10.1080/2331186x.2020.1787018

Arianto, F., & Hanif, M. (2024). Evaluating metacognitive strategies and self-regulated learning to predict primary school students' self-efficacy and problem-solving skills in science learning. *Journal of Pedagogical Research*, *8*(3), 301-319. https://doi.org/10.33902/jpr.202428575

Bagci, H., & Unveren, D. (2020). Investigation of the relationship between metacognitive awareness of reading strategies and self-efficacy perception in reading comprehension in mother-tongue: Sample of 8th graders. *International Journal of Educational Methodology, 6*(1), 83-98. https://doi.org/10.12973/ijem.6.1.83

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological review*, *84*(2), 191. https://doi.org/10.1037/0033-295x.84.2.191

Bandura, A., & Wessels, S. (1994). *Self-efficacy* (Vol. 4, pp. 71-81).

Boyask, R., Jackson, J., Milne, J., Harrington, C., & May, R. (2024). We enjoy doing reading together: Finding potential in affective encounters with people and things for sustaining volitional reading. *Language and Education*, 1-18. https://doi.org/10.1080/09500782.2024.2337658

Cai, Y., & Zhao, C. (2023). Metacognitive strategies and self-efficacy co-shape L2 achievement: A multilevel structural equation modeling approach. *System, 117*, 103099. https://doi.org/10.1016/j.system.2023.103099

Clark, C., & Teravainen, A. (2017). What it means to be a reader at age 11: Valuing skills, affective components, and behavioral processes, An outline of the evidence. National Literacy Trust. https://doi.org/10.1002/9781119171492.wecad296

Dadandı, P. U., & Dadandı, İ. (2022). The relationships among teachers' behaviors that encourage students' reading engagement, reading enjoyment, reading self-efficacy, and reading success. *Participatory Educational Research, 9*(3), 98-110. https://doi.org/10.17275/per.22.56.9.3

Dornyei, Z. (2007). *Research methods in applied linguistics*. Oxford University Press. https://doi.org/10.1093/applin/amq023

Ebrahimi, S. S., & Jiar, Y. K. (2018). IRANIAN STUDENTS'PERCEPTIONS ON POETRY READING STRATEGIES. *European Journal of Education Studies*. http://oapub.org/edu/index.php/ejes/article/view/1592

Ebrahimi, S. S., & Zainal, S. (2018). Actual poetry reading strategies by English as a foreign language learner. *International Journal of Advanced Research*, *6*(6), 953-975. https://doi.org/10.21474/ijar01/7299

Flavell, J. H. (1979). Metacognition and metacognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist, 34*, 906-911. https://doi.org/10.1037//0003-066x.34.10.906

Gajria, M., & Jitendra, A. K. (2016). Effective strategies for developing reading comprehension. In *Interventions in learning disabilities: A handbook on systematic training programs for individuals with learning disabilities* (pp. 119-137). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-31235-4_8

Guthrie, J. T., Wigfield, A., & VonSecker, C. (2000). Effects of integrated instruction on motivation and strategy use in reading. Journal of Educational Psychology, 92(2), 331. https://doi.org/10.1037//0022-0663.92.2.331

Ghaith, G., & El-Sanyoura, H. (2019). Reading comprehension: The mediating role of metacognitive strategies. https://doi.org/10.64152/10125/66748

Juhkam, M., Jõgi, A. L., Soodla, P., & Aro, M. (2023). Development of reading fluency and metacognitive knowledge of reading strategies during reciprocal teaching: do these changes actually contribute to reading comprehension? *Frontiers in Psychology*, *14*, 1191103. https://doi.org/10.3389/fpsyg.2023.1191103

Hayat, A. A., Shateri, K., Amini, M., & Shokrpour, N. (2020). Relationships between academic self-efficacy, learning-related emotions, and metacognitive learning strategies with academic performance in medical students: A structural equation model. *BMC Medical Education, 20*, 1-11. https://doi.org/10.1186/s12909-020-01995-9

Immink, A. M. (2023). The effect of modeling metacognitive strategies using explicit direct instruction on fourth-grade students' metacognitive awareness and reading comprehension achievement (Master's thesis, University of Twente). http://essay.utwente.nl/94443/

Kim, H., Kim, E. J., & Han, S. J. (2025). Can metacognitive reading strategies be promoted by motivational factors among high school students in South Korea? *The Asia-Pacific Education Researcher*, 1-13. https://doi.org/10.1007/s40299-025-00991-1

Klimova, B., Zamborova, K., & Fronckova, K. (2024). Metacognitive Reading Awareness Among Freshmen EFL Students. *PSYCHOLINGUISTICS*, *35*(2), 65-81. https://doi.org/10.31470/2309-1797-2024-35-2-65-81

Kolb, C. L. (2014). Relationships between discourse, reader identity, and reading self-efficacy in a high school English classroom: A mixed-methods, critical ethnographic study (Doctoral dissertation, University of Minnesota). https://search.proquest.com/openview/ef83af9c59d5b87e3d3b116996f381af/1?pq-origsite=gscholar&cbl=18750

Koşar, G., Akbana, Y. E., & Yakar, L. (2022). Development and validation of a reading self-efficacy scale. *International Journal of Assessment Tools in Education, 9*(1), 203-219. https://doi.org/10.21449/ijate.894688

Li, J. T., Tong, F., Irby, B. J., Lara-Alecio, R., & Rivera, H. (2024). The effects of four instructional strategies on English learners' English reading comprehension: A meta-analysis. *Language Teaching Research*, *28*(1), 231-252. https://doi.org/10.1177/1362168821994133

Mohseni, F., Seifoori, Z., & Ahangari, S. (2020). The impact of metacognitive strategy training and critical thinking awareness-raising on reading comprehension. *Cogent Education, 7*(1), 1-22. https://doi.org/10.1080/2331186x.2020.1720946

Mokhtari, K., Dimitrov, D. M., & Reichard, C. A. (2018). Revising the metacognitive awareness of reading strategies inventory (MARSI) and testing for factorial invariance. *Studies in Second Language Learning and Teaching, 8*(2), 219-246. https://doi.org/10.14746/ssllt.2018.8.2.3

Mokhtari, L., & Reichard, C. A. (2002). Assessing students' metacognitive awareness of reading strategies. *Journal of Educational Psychology, 94*(2), 249-259. https://doi.org/10.1037//0022-0663.94.2.249

Moritz, S., & Lysaker, P. H. (2018). Metacognition, what did James H. Flavell really say and the implications for the conceptualization and design of metacognitive interventions. *Schizophrenia Research, 201*, 20-26. https://doi.org/10.1016/j.schres.2018.06.001

Naqvi, S., Srivastava, R., Al Damen, T., Al Aufi, A., Al Amri, A., & Al Adawi, S. (2023). Establishing reliability and validity of an online placement test in an Omani higher education institution. *Languages*, *8*(1), 61. https://doi.org/10.3390/languages8010061

Rezaee, A. A., & Salehi, M. (2009). The construct validity of a language proficiency test: A multitrait multimethod approach. *Teaching English Language*, *3*(1), 93-110. https://www.researchgate.net/publication/283142261

Rogiers, A., Van Keer, H., & Merchie, E. (2020). The profile of the skilled reader: An investigation into the role of reading enjoyment and student characteristics. *International Journal of Educational Research, 99*, 101512. https://doi.org/10.1016/j.ijer.2019.101512

Shehzad, M. W., Lashari, S. A., Alghorbany, A., & Lashari, T. A. (2019). Self-efficacy sources and reading comprehension: The mediating role of reading self-efficacy beliefs. *3L: Language, Linguistics, Literature, 25*(3). https://doi.org/10.17576/3l-2019-2503-07

Smith, J. K., Smith, L. F., Gilmore, A., & Jameson, M. (2012). Students' self-perception of reading ability, enjoyment of reading, and reading achievement. *Learning and Individual Differences, 22*(2), 202-206. https://doi.org/10.1016/j.lindif.2011.04.010

Teng, M. F. (2025). *Metacognition in language teaching*. Cambridge University Press.

Webber, C., Wilkinson, K., Duncan, L. G., & McGeown, S. (2024). Adolescents' perspectives on the barriers to reading for pleasure. *Literacy, 58*(2), 204-215. https://doi.org/10.1111/lit.12359

Wei, D., Xu, C., & Zheng, X. (2025). Motivation and metacognitive strategy use in reading English as a foreign language among adolescent learners. *The Asia-Pacific Education Researcher*, *34*(3), 1091-1099. https://doi.org/10.1007/s40299-024-00923-5

Guthrie, J. T., & Wigfield, A. (2000). Engagement and motivation in reading. *New York*.

Wistner, B., Sakai, H., & Abe, M. (2009). An analysis of the Oxford Placement Test and the Michigan English Placement Test as L2 proficiency tests. *Bulletin of the Faculty of Letters, Hosei University*, *58*(2), 33-44.
https://www.academia.edu/download/36957728/Wistner__Sakai____Abe_2009_An_Analysis_of_the_Oxford_Placement_Test_and.pdf

Zarei, A. A. (2018). On the relationship between metacognitive reading strategies, reading self-efficacy, and L2 reading comprehension. *Journal of English Language Teaching and Learning, 10*(22), 157-181. https://elt.tabrizu.ac.ir/article_8342_1003.html?lang=fa

Zheng, R. (2023). An analysis of the current situation of Chinese university students' English reading self-efficacy and a proposed intervention program for enhancement. *Pacific International*. https://doi.org/10.55014/pij.v6i2.377

Zhou, S., & Zhang, Y. (2025). Developmental trajectories of and reciprocal relationships between Chinese university students' foreign language reading self-efficacy and reading strategy use. *Frontiers in Psychology*, *16*, 1512098. https://doi.org/10.3389/fpsyg.2025.1512098