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# Examining the Relationship Between Attitude, Language Aptitude, and Reading Achievement: A Gender-Based Analysis

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## Original Article

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## Abstract:

Aptitude and attitude are widely recognized as influential individual-difference variables in second language (L2) development and academic achievement. The present study investigated the relationships among Iranian English as a Foreign Language (EFL) learners' language aptitude, attitudes toward language learning, gender, and reading comprehension achievement. A total of 150 pre-intermediate male and female learners from private language institutes participated in the study. Language aptitude was measured using the LLAMA aptitude tests developed by Meara (2005), and learners' attitudes were assessed using the Beliefs about Language Learning Inventory (BALLI) designed by Horwitz (1988). At the end of the semester, a standardized reading comprehension test was administered to measure learners' achievement. The data were analyzed using Pearson Correlations, multiple linear regression, and an independent-samples t test. The results revealed a significant positive relationship between language aptitude and reading comprehension achievement. Among the aptitude components, vocabulary learning ability emerged as the strongest predictor. Learners' attitudes toward language learning also showed a statistically significant but moderate contribution to reading performance. However, no significant gender differences were found in reading comprehension. Overall, the findings highlighted the primary role of cognitive aptitude, particularly vocabulary learning ability, and the supportive role of attitude in EFL reading development. The study offered pedagogical implications for improving reading instruction and suggested directions for future research on individual differences in language learning. These findings may also assist educators in designing more effective, learner-centered instructional practices.

**Keywords:** Aptitude, Attitude, LLAMA Aptitude Test, BALLI, Reading Achievements

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## 1. INTRODUCTION

Language aptitude, alternatively referred to as aptitude, encompasses a set of cognitive faculties that reliably predict progress in second language acquisition (SLA; Aguado, 2012). Understanding aptitude is imperative for gaining a nuanced comprehension of the intricacies involved in the process of SLA. It also has notable realistic inferences in the context of language teaching and learning. Enhanced aptitude for learning a second or foreign language indicates a heightened propensity for successful

adaptation to educational or real-life contexts in the target language. This is supported by accelerated learning progress and higher levels of achievement observed upon completion of instructional programs (Robinson, 2013).

Greater aptitude for second or foreign-language learning anticipates more successful adaption to teach or real-life subject to the second language (L2), as determined by rapid advancement in learning and greater levels of achievement upon the culmination of an instructional course. (Robinson, 2013). Language learning

aptitude indicates how well one can acquire a second language in a particular period and circumstances (Carroll & Sapon, 1959). According to Robinson (2005), language learning aptitude is also described as the learners' competence in cognitive abilities and knowledge procedure during L2 learning under different circumstances. Moreover, Gender differences provide a pivotal section of language learning research. Nowadays, abounding accomplishments have been made in investigating gender differences in language learning.

Over the years, experts have especially examined gender differences in aptitude test scores (Daif-Allah, 2012; Fattahi & Nushi, 2021; Forghani & Shokrpour, 2016; Habl, 2018; Rashvand & Ghorbani, 2020; Spinath et al., 2014; Zolyomi, 2022). Regarding language aptitude, most investigators have observed that females are inclined to have higher aptitude than their male counterparts. In the field of L2 research, gender has been recognized by scholars as encompassing "not only the anatomical distinctions, such as neural distinctions in the brains of females and males but also as a socially constructed variable influenced by the multifaceted ways in which individuals of different sexes interact within a particular cultural context" (Nyikos, 2008, pp. 73-74, as cited in Lee, 2020).

Likewise, the notion of learners' attitudes has recently received significant attention from first and second-language researchers in social psychologists' descriptions of human behavior. Gardner (2000) asserted that attitude is usually defined as learners' reactions to anything related to a particular situation, such as teachers or subject matters in language learning. It has a crucial impact on language performance. Cakici (2007) concurred that as a socio-psychological aspect, the function of attitude in the language learning procedure should be taken into deep account, primarily since a positive attitude toward a second language can be driven to support and enhance second language learning (De Bot et al., 2007). To support this claim, Karahan (2007) declared that positive attitudes made students adopt a positive inclination toward language learning. Therefore, measuring students' attitudes toward language learning might be valuable (Gardner, 2007). Many studies have examined the relationships between attitude and proficiency in the language (e.g., Cancino & Ubilla, 2021; Larasati & Simatupang, 2020; Novran Alfarizi, 2020; Taghizadeh Kerman et al., 2023; Zeinivand et al., 2015). A diversity of variables, such as language learners' gender, has been regarded as necessary parameters to study attitude and learning differences (Molden & Dweck, 2006; Sullivan & Schatz, 2009).

Additionally, the capability to read and comprehend a text is regarded as one of the fundamental aspects of success in life (Van den Broek & Espin, 2012). The correlation between students' perceptions of reading and their reading achievements has been a subject of extensive investigation in the scholarly literature, as documented by multiple studies (Fawson et al., 2009; Karabay et al., 2015; Keskin, 2013; Martínez et al., 2008). A good comprehension of different texts and a positive attitude toward reading are prerequisites for being a good reader. Gender is one of the main factors in language achievement. Carr and Pauwels (2006) asserted that girls were strong in reading skills, and with their interest in reading and literacy, they could cover their under-ability in abstract concepts, rules, and patterns.

Fauzan (2016) found that gender differences impacted reading comprehension achievements to some degree. Although certain researchers have delved into the impact of aptitude and attitude on language acquisition, there might be a scarcity of studies that have specifically investigated the ramifications of aptitude and attitude on reading comprehension among Iranian EFL learners of both genders. Therefore, the present research examined how the main variables (i.e., aptitude and attitude) affected the reading achievements of male and female Iranian EFL learners during an academic semester.

## 2. LITERATURE REVIEW

### 2.1. Language Learning Aptitude

The concept of language learning aptitude (LLA) primarily pertains to an inherent proficiency in acquiring proficiency in a second or foreign language. It is considered relatively unchanging when an individual matures (Skehan, 2002). In other words, LLA is an ability that mostly finds out how fast and well an individual will progress in learning a language. As is the case for other kinds of aptitude, such as verbal and musical abilities; it is considered an innate and relatively fixed talent for learning languages throughout an individual's lifetime. According to Safar and Kormos (2008), language aptitude exhibits a stable nature as an agent and resists significant fluctuations over short periods.

Consequently, language aptitude manifests as a continuum rather than a dichotomy, encompassing a spectrum of abilities rather than simply categorizing learners as possessing or lacking talent for languages. Contrary to the traditional concept of LLA that viewed the aptitude construct as an innate and entirely fixed talent to acquire and process language structures (Bylund et al., 2010), the current concept demonstrates that LLA is changeable from birth such that alertness from experience and instruction might also influence it (Robinson, 2002). The Modern Language Aptitude Test (MLAT), initially proposed by Carroll and Sapon in 1959, has gained extensive utilization by various organizations and researchers worldwide, as evidenced by studies conducted (e.g., Jackson & Kaplan, 2001; Stansfield & Reed, 2019; Stansfield & Winke, 2008). Subsequently, Meara (2005) developed the Language Learning and Multilingual Aptitude (LLAMA) tests as a series of aptitude assessments based on the standardized MLAT tests. According to Carroll and Sapon (2002), the LLAMA tests comprise four distinct sub-tests, namely grammatical inferencing (LLAMA\_F), vocabulary learning (LLAMA\_B), sound-symbol correspondence (LLAMA\_E), and phonetic (implicit) memory (LLAMA\_D).

### 2.2. Language Learning Attitude

Language learning attitude encompasses learners' evaluative beliefs, feelings, and dispositions toward language learning, the target language, and the learning context. Attitude is closely associated with motivation and has been shown to play an important role in shaping learners' engagement, persistence, and overall learning behavior. Situation-specific motivation emerging from immediate instructional experiences can influence learners' attitudes toward language learning (Papi, 2010). Research in second language acquisition has consistently indicated that positive attitudes toward language learning are linked to higher levels of

effort and achievement (Dörnyei, 2019). Nevertheless, attitude is not considered a wholly stable trait; rather, it develops through interaction with instructional practices, social environments, and prior learning experiences. Al-Hoorie (2018) further emphasized that while attitude may strongly predict learners' intended effort, its relationship with objective achievement measures tends to be comparatively weaker.

### 2.3. Gender as an Individual Difference Variable

Gender has long been acknowledged as a relevant individual difference variable in second language acquisition research. From both biological and socio-cultural perspectives, gender may shape learners' preferences, interactional styles, motivational orientations, and learning behaviors (Tannenbaum et al., 2016). The rationale for including gender in conducting research is multifold. Gender is significant in interactions, preferences, decision-making, etc. It might influence the way in which a study is carried out. It might further unfold why, for whom, and under what conditions the research is being conducted. In essence, the emerging patterns in various studies can operate differently concerning participants' gender. Moreover, since methods for analyzing gender can be both quantitative and qualitative, without considering its role, appropriate implementation techniques can be ignored inadvertently. As a result, gender is often examined as a variable that may moderate or condition the relationships among cognitive and affective learner characteristics, such as aptitude and attitude. In SLA research, gender has been investigated not as an isolated determinant of achievement but as a contextual variable that may help explain variations in learning outcomes across different learner populations. Consequently, examining gender alongside other individual difference variables provides a more nuanced understanding of language learning processes.

### 2.4. Empirical Studies

A substantial body of empirical research has explored the relationship between language aptitude and second language reading achievement. Winke (2013), for example, examined the interrelationships among aptitude, motivation, and strategy use in L2 reading, listening, and speaking. The findings indicated that aptitude accounted for a relatively small proportion of variance in reading comprehension, suggesting that the relationship between aptitude and reading achievement is complex and potentially mediated by other variables. Similarly, Muñoz (2014) investigated the associations between aptitude scores and different language skills, including reading, listening, speaking, and writing. The results revealed significant correlations between aptitude and receptive skills such as reading and listening, although the predictive strength of aptitude was weaker for speaking proficiency.

In the Iranian EFL context, Rashvand and Ghorbani (2020) examined the relationship between LLAMA-measured aptitude and learners' educational attainments, considering the moderating role of gender. Their findings demonstrated a significant association between aptitude and achievement, with sound-symbol correspondence emerging as the strongest predictor, while sound recognition showed the weakest association. Sok and Shin (2021) similarly reported that aptitude and phonological working memory were strong predictors of L2 listening and reading comprehension.

More recent empirical studies have continued to confirm the relevance of language aptitude for L2 reading development. Sparks and Alamer (2024) demonstrated that second language aptitude and first language reading ability jointly predicted growth in L2 reading achievement over time, highlighting the longitudinal contribution of aptitude to reading development. In another study, Sparks et al. (2025) showed that L2 aptitude remained a significant predictor of reading achievement even when motivational and exposure-related variables were taken into account. Additionally, Roehr-Brackin and Pavlekovic (2025) found that LLAMA aptitude scores significantly predicted reading and grammar performance among adult EFL learners, suggesting that aptitude continues to play a meaningful role across age groups and learning contexts.

Numerous studies have further examined the relationship between learners' attitudes toward language learning and their reading achievement. Lee and Schallert (2014) explored the associations among first language (L1) and L2 reading attitudes, language proficiency, and reading comprehension. Their findings revealed significant relationships between reading attitudes and reading achievement, although distinct patterns emerged across L1 and L2 contexts. Yusnitasari and Novita (2022) also reported a moderate positive correlation between learners' attitudes toward language learning and their reading comprehension achievement. In a large-scale study conducted in Kazakhstan, Akhmatova et al. (2022) found that although learners generally displayed positive attitudes toward reading, the correlation between reading attitude and reading achievement was relatively modest. Importantly, the study reported no statistically significant gender differences in reading attitudes or achievements across the languages examined. Cancino and Ubilla (2021) further investigated the relationship between reading attitudes in L1 and L2 among EFL learners and found weak correlations between the two, highlighting the influence of contextual and demographic factors rather than proficiency alone.

Recent studies have further reinforced the role of affective variables in reading achievement. Huang (2024) reported a significant positive relationship between learners' attitudes toward English and their reading comprehension achievement among EFL learners. Likewise, Teimouri et al. (2024) demonstrated that affective-motivational factors, alongside cognitive abilities such as aptitude, were significantly associated with language achievement, though gender did not consistently moderate these relationships. More recently, Zhang and Kim (2025) found that reading self-efficacy and positive attitudes toward reading were significant correlates of reading comprehension performance in EFL learners, suggesting that attitudinal variables continue to play a meaningful role in reading outcomes.

Empirical findings concerning gender differences in aptitude, attitude, and reading achievement remain mixed. Some studies have reported gender-based differences favoring female learners in verbal intelligence and reading-related attitudes (Kush et al., 2005; McKenna et al., 2012; Spinath et al., 2014). Other studies, however, have found no significant gender differences in language aptitude or reading achievement. Lee (2020), for instance, examined the relationships among aptitude, motivation, strategy use, and vocabulary knowledge and found that while aptitude directly predicted vocabulary outcomes, gender did not

significantly influence the interrelationships among the individual difference variables. Similarly, Rashvand and Ghorbani (2020), Akhmatova et al. (2022), and Teimouri et al. (2024) reported no statistically significant associations between gender and learners' reading achievement.

### 2.5. The Current Study

Despite various studies focusing on language aptitude and learners' attitudes in isolation, there is a notable dearth, if not a complete absence, of research that has explored the interplay between language aptitude, learners' attitudes, and their impact on reading achievements within an Iranian context. Consequently, the current study examined the correlation between language aptitude, attitudes, and reading achievements in male and female Iranian EFL learners. The primary aim of the research was to tackle the following research inquiries:

1. Does Iranian EFL learners' aptitude predict their reading achievement?
- Sub-question:* Which LLAMA aptitude subtests are more influential in predicting Iranian EFL learners' reading achievements?
2. Does Iranian EFL learners' attitude predict their reading achievement?
  3. Is there any significant relationship between the gender of Iranian EFL learners and their reading achievements?

## 3. METHODOLOGY

### 3.1. Participants

The study included 150 Iranian university students from Islamic Azad University (IAU), East Tehran Branch. The sample encompassed 54 female students and 96 male students pursuing studies in various subject fields. Convenience sampling methods were employed to select the participants. All participants spoke Farsi as their native language, and their ages ranged from 18 to 29 years. The students' English proficiency level was assessed as pre-intermediate based on their performance in the Preliminary English Test (PET). The ethical considerations of the participants were duly observed. Table 1 displays the demographic characteristics of the participants.

### 3.2. Instruments

#### 3.2.1. Preliminary English Test (PET)

To ensure the participants' English language proficiency levels

were consistent and comparable, the PET (exam updates 2020) was administered at the study's outset. This test is appropriate for learners of a pre-intermediate level who can deal with everyday written and spoken communication. The PET was organized into four parts: reading, writing, listening, and speaking. The total mark for each part was estimated as 25%. The reading section included six parts and 23 questions, the writing had two parts and two questions, the listening consisted of 4 parts and 25 questions, and the speaking part consisted of 4 parts. The participants were allotted one hour and thirty minutes to complete the aforementioned test.

#### 3.2.2. LLAMA Aptitude Test

Meara's (2005) LLAMA aptitude tests were utilized in the study to evaluate the participants' aptitude. The LLAMA tests consist of four sub-components: LLAMA B, LLAMA D, LLAMA E, and LLAMA F. LLAMA B focuses on vocabulary learning and assesses the learners' ability to associate unfamiliar names with unfamiliar objects. LLAMA D is a phonetic implicit memory task that involves sound recognition and implicit learning. LLAMA E is a task that pertains to sound-symbol correspondence. Lastly, LLAMA F is a grammatical inferencing task that measures explicit inductive learning ability. These four sub-components were employed to gauge the participants' aptitude in the study.

**Validity and Reliability:** The LLAMA tests have been widely validated in numerous studies as reliable measures of language aptitude (Meara, 2005). Construct validity has been supported by significant correlations with other standardized aptitude tests, such as the MLAT, and by predictive validity in relation to L2 learning outcomes, particularly vocabulary acquisition and grammatical inferencing (Meara, 2005; Sok & Shin, 2021). Internal consistency for the subtests has been reported in previous research (Alderson et al., 1995; Sok & Shin, 2021) with Cronbach's alpha values ranging from 0.70 to 0.85, indicating acceptable reliability.

#### 3.2.3. Beliefs about Language Learning Inventory (BALLI)

In this scholarly investigation, the research methodology included the utilization of the Beliefs About Language Learning Inventory (BALLI), initially developed by Horwitz (1988). The inventory consisted of a comprehensive collection of 34 declarative statements, and participants were required to provide their assessments using a carefully constructed 5-point Likert

**Table 1.** Demographic Background of the Participants

Number of Participants	150
Proficiency Level	Pre-intermediate
Age	18-29
Gender	Male (96) and Female (54)
Native Language	Persian
Target Language	English
Major	Different subjects' fields
Level of proficiency	pre-intermediate
University	IAU East Tehran Branch
Academic Year	2022

scale, ranging from “strongly disagree” to “strongly agree.” The participants were given a time limit of 30 minutes to complete the questionnaire. Considering the research findings of different studies (e.g., Nikitina & Furuoka, 2006), it can be further concluded that Horwitz’s (1988) instrument is considered to be a valid and reliable tool for conducting research on language learning beliefs in different socio-linguistic settings.

**Validity and Reliability:** BALLI has been validated in diverse sociolinguistic contexts (Horwitz, 1988; Nikitina & Furuoka, 2006). Content validity is established through its comprehensive coverage of belief domains, including language difficulty, learning strategies, and the nature of language learning. Reliability analyses in prior research (Horwitz, 1988; Nikitina & Furuoka, 2006) have reported acceptable internal consistency, with Cronbach’s alpha coefficients ranging from 0.70 to 0.82 across subscales. In the current study, the overall Cronbach’s alpha for BALLI was calculated as 0.78, indicating satisfactory reliability.

### 3.2.4. Reading Comprehension Test

The researchers devised a reading comprehension test to evaluate the reading accomplishments of the learners. This assessment was administered towards the conclusion of the academic term and was sourced from the participants’ designated textbook. The assessment comprised a set of 30 queries, each carrying a maximum score of 30 points. A duration of 30 minutes was allotted for the completion of this examination. Participants were granted a total of 90 minutes to finalize their responses and submit their answers.

**Validity and Reliability:** The content validity of the test was ensured by aligning all items with the textbook’s learning

objectives and receiving expert judgment from three experienced EFL instructors. Construct validity was further supported by pilot-testing the instrument with a comparable group of learners, showing consistent item difficulty and discrimination indices. The internal consistency reliability of the reading test in the pilot study was calculated using Cronbach’s alpha, which yielded a value of 0.81, indicating good reliability.

### 3.3. Design and Context of the Study

The study adopted a descriptive correlational design, as the researchers employed this methodological approach to examine the relationships among the variables of interest. These variables included learners’ aptitude, attitude, gender, and Iranian EFL learners’ reading scores. This research was conducted in Iran. The data were gathered during Fall 2022.

### 3.4. Data Collection Procedure

Data collection for the current study was implemented through the administration of PET, LLAMA aptitude test, BALLI, and a reading

test. Meara’s (2005) LLAMA aptitude tests and Horwitz’s (1988) BALLI were administered to the students in different sessions. Participants were requested to respond to each section at a designated pace. Furthermore, upon reaching the semester’s culmination, an assessment of reading comprehension was administered to all participants, encompassing a comprehensive evaluation of their comprehension abilities. Scores for each participant were computed.

### 3.5. Data Analysis Procedure

**Table 2.** The Descriptive Statistics of Predictor and Criterion Variables in Regression Equation (N = 150)

	N	Mean	Std. Deviation	Skewness	Kurtosis		
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Vocabulary Learning	150	53.1667	24.43603	.147	.198	-.886	.394
Phonetic Memory	150	26.9000	16.47318	.362	.198	-.234	.394
Sound Symbol Correspondence	150	74.5667	23.88406	-1.060	.198	.558	.394
Grammatical Inferencing	150	35.8667	23.14781	.163	.198	-.830	.394
Attitude	150	47.6250	13.76696	-.131	.198	-.254	.394
Reading Comprehension	150	2.3278	1.04805	-.451	.198	-1.038	.394
Valid N (Listwise)	150						

**Table 3.** Pearson Correlations Among Language Aptitude Components, Attitude, and Reading Comprehension (N = 150)

Item	Variable	1	2	3	4	5	6
1.	Vocabulary Learning	—					
2.	Phonetic Memory	.42**	—				
3.	Sound–Symbol Correspondence	.48**	.39**	—			
4.	Grammatical Inferencing	.51**	.36**	.45**	—		
5.	Attitude	.29**	.21*	.27**	.31**	—	
6.	Reading Comprehension	.72**	-.34**	.66**	.81**	.38**	—

Note.  $p < .05$ ,  $p < .01$  (two-tailed).

Intending to conduct data analysis, the researchers employed the Statistical Package for the Social Sciences (SPSS), a powerful software tool widely employed in statistical analysis. Once all the requisite data had been collected, they were transformed into coded form and subsequently fed into the SPSS software, specifically version 24, for further processing. Using correlation techniques, the researchers conducted analyses to investigate the interrelationships among the study's variables, encompassing aptitude, attitude, gender, and reading scores. Furthermore, a comprehensive multiple regression analysis was executed to determine the degree to which each independent and moderating variable could effectively forecast the outcome variable of the research.

## 4. RESULTS

### 4.1 First Research Question Analysis Report

Out of the 150-study population, 94 were male, and 56 were female. In other words, 63% of the sample were male, and 37% were female. Before performing the regression analysis, the researchers meticulously scrutinized the statistical assumptions associated with it. Initially, their focus was on assessing the normality assumptions. The results, as displayed in Table 2, revealed that the measures of skewness and kurtosis fell within the acceptable range of -2 to +2. By referencing the work of Tabachnick and Fidell (2013), it was affirmed that the data met the normality assumption. Additionally, Table 2 comprehensively depicts the mean values and standard deviations of each variable under investigation. The aptitude value was obtained using the mean of the variables Grammatical Inferencing, Sound Symbol Correspondence, Phonetic Memory, and Vocabulary Learning. Given the kurtosis values, it was clear that the data had a relatively small change. Also, the skewness of the Sound Symbol Correspondence variable was negative, indicating the existence of outliers in this variable.

Prior to conducting regression analyses, Pearson Product–Moment Correlation Coefficients were computed to examine the bivariate relationships among language aptitude components, attitude, and reading comprehension scores. Table 3 depicts the results;

As presented in Table 3, reading comprehension was strongly and positively correlated with several components of language aptitude. The strongest association was observed between grammatical inferencing and reading comprehension ( $r = .81, p < .01$ ), indicating that learners with higher grammatical inferencing ability tended to achieve substantially higher reading comprehension scores. Similarly, vocabulary learning demonstrated a strong positive relationship with reading comprehension ( $r = .72, p < .01$ ), suggesting that lexical learning ability plays a central role in EFL reading development. A further strong correlation was found between sound–symbol correspondence and reading comprehension ( $r = .66, p < .01$ ), highlighting the importance of form–meaning mapping skills in reading performance.

In contrast, phonetic memory was moderately and negatively correlated with reading comprehension ( $r = -.34, p < .01$ ), indicating that higher reliance on short-term phonetic storage alone was associated with lower reading comprehension scores. This pattern suggests that phonetic memory, when not integrated

with higher-level inferencing skills, may play a limited or even inhibiting role in reading comprehension at the intermediate level. With respect to affective variables, attitude toward language learning showed a moderate positive correlation with reading comprehension ( $r = .38, p < .01$ ), indicating that learners with more favorable attitudes tended to demonstrate better reading performance, although the magnitude of this relationship was weaker than that observed for cognitive aptitude components.

Intercorrelations among the aptitude subcomponents ranged from small to moderate ( $r = .36$  to  $.51$ ), suggesting that while these components are related, they represent distinct yet complementary dimensions of language aptitude. Importantly, none of the correlations among predictors exceeded  $.70$ , indicating the absence of multicollinearity concerns and supporting their simultaneous inclusion in subsequent regression models. Overall, the presence of statistically significant correlations between reading comprehension and all predictor variables ( $p < .05$ ) satisfies the assumption of linear association and confirms the appropriateness of conducting regression analyses to further examine the predictive contributions of language aptitude components and attitude to EFL reading achievement.

Additionally, to examine the impact of Iranian EFL learners' aptitude on their reading achievement, a multiple linear regression analysis was employed. To this end, the governing hypotheses of the regression model were first examined. These hypotheses covered four points: 1. Residuals from the model were expected, and 2. The average residual mean was zero, 3. The variance of the residual was homogeneous, and 4. There was no multiple linear regression between predictor variables.

The unstandardized regression coefficients ( $B$ ), standardized regression co-efficient ( $\beta$ ),  $R$ ,  $R^2$ , and adjusted  $R^2$  were shown in Table 4. According to Table 4, Iranian EFL learners' aptitude including vocabulary learning, phonetic memory, sound symbol correspondence, and grammatical inferencing ( $B = 0.219, -0.834, 0.186, 0.518, S.E = .004, .005, .004, .004, \beta = .510, -.231, .370, .114, t = .597, -1.557, .427, 1.343, p = .004$ ) did significantly predict their reading scores.

As can be seen in Table 4,  $R$  for regression was meaningfully different from zero,  $F(4, 145) = 634.639, p = .00$ , with  $R^2$  at  $.946$ , suggesting the significance of this regression model. The adjusted  $R^2$  value of  $.946$  indicated that 94% of the variability in total scores was predicted by participants' aptitude. In conclusion, the answer to the first question was positive.

To address the given sub-question on which LLAMA aptitude subtests were more influential in predicting Iranian EFL learners' reading achievements, as depicted in Table 4, the beta values indicated the standardized coefficients for each LLAMAs. Based on standardized beta coefficients, vocabulary learning emerged as the strongest predictor of reading comprehension ( $\beta = .510$ ), followed by sound–symbol correspondence ( $\beta = .370$ ). Grammatical inferencing showed a smaller but statistically significant contribution, while phonetic memory demonstrated a negative predictive relationship with reading comprehension.

### 4.2 Second Research Question Analysis Report

To deal with the second research question on the impact of Iranian EFL learners' attitudes on their reading achievement, a simple linear regression was conducted. The unstandardized regression coefficients ( $B$ ), standardized regression coefficient

**Table 4.** Multiple Regression Analysis Predicting Reading Comprehension from Language Aptitude Components (N = 150)

Model		Unstandardized		Standardized		
		Coefficients		Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.129	.324		6.575	.000
	Vocabulary Learning	.219	.004	.510	.597	.006
	Phonetic Memory	-.834	.005	-.231	-1.557	.001
	Sound Symbol Correspondence	.186	.004	.370	.427	.007
	Grammatical Inferencing	.518	.004	.114	1.343	.002

  

<i>Test of Significance of Regression Equation</i>					
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	154.850	4	38.713	634.639	.004 <sup>b</sup>
Residual	8.812	145	.061		
Total	163.662				

  

<i>R, R 2, adjusted R 2, and Test of Independence of Residuals of Simple Regression Analysis</i>			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.972 <sup>a</sup>	.946	.946	1.04654

\* Note: a. Dependent Variable: Reading Comprehension, b. Predictors: (Constant), Grammatical Inferencing, Vocabulary Learning, Phonetic Memory, Sound Symbol Correspondence

( $\beta$ ),  $R$ ,  $R^2$ , and adjusted  $R^2$  are shown in Table 5. According to Table 5, Iranian EFL learners' attitude ( $B = 0.435$ ,  $S.E = .086$ ,  $\beta = 0.383$ ,  $t = 5.036$ ,  $p = .000$ ) did slightly predict their reading scores. As can be seen in Table 5,  $R$  for regression was meaningfully different from zero,  $F = 149$ ,  $p = .000$ , with  $R^2$  at .146, suggesting the significance of this regression model. The adjusted  $R^2$  value of .141 indicated that 14% of the variability in total scores was predicted by participants' attitudes. In conclusion, the answer to the second question was positive to a small degree.

### 4.3 Third Research Question Analysis Report

To come up with the third research question on the relationship between Iranian EFL learners' gender and their reading achievement, an independent sample t-test was applied. Table 6 illustrates the value of descriptive statistics, and Table 6 explains the analysis results.

As shown in Table 7, the means were compared using the first row. Due to the significant value bearing a value equal to 0.886, this number was higher than 0.05; thus, there was no difference between the reading comprehension scores between the genders of men and women as they received identical scores.

## 5. DISCUSSION

The analyses revealed a significant relationship between learners' aptitude and their reading comprehension performance, while the relationship with attitude was moderate. No significant differences were observed between genders. These findings can be interpreted

within the theoretical framework of language learning aptitude and individual differences in EFL, which posited that learners' inherent cognitive abilities, such as grammatical inferencing, phonological memory, and vocabulary learning capacity, would facilitate efficient language acquisition (Meara, 2005; Skehan, 2002). According to aptitude theory, learners with higher aptitude were better equipped to process and internalize linguistic input, enabling them to perform more effectively in tasks such as reading comprehension. Thus, the significant association observed in our study aligns with the theoretical expectation that aptitude directly influences language achievement.

Our results are consistent with prior empirical findings. Munoz (2014) also identified significant correlations between aptitude and language skills such as reading, listening, and writing. Similarly, Rashvand and Ghorbani (2020) found a significant relationship between aptitude and EFL learners' attainment scores, and Lee (2020) concluded that aptitude directly influenced the breadth and depth of learners' vocabulary knowledge. These findings further support the theoretical claim that aptitude serves as a critical cognitive resource that facilitates the acquisition of complex linguistic structures, which in turn underpins reading comprehension performance.

The non-significant effect of gender on reading achievement in our study can also be justified through the lens of individual differences theory. While some prior research had suggested gender-based differences in verbal intelligence or language attitudes (Daif-Allah, 2012; Forghani & Shokrpour, 2016;

**Table 5.** Regression Coefficients of Regression Analysis

Model		Unstandardized		Standardized		t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta				Tolerance	VIF
1	(Constant)	.762	.321			2.373	.019		
	Attitude to learning	.435	.086	.383		5.036	.000	1.000	1.000

*Test of Significance of Regression Equation*

Test Value = 0						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Standardized Residual	.000	149	1.000	.00000000	-.1607985	.1607985

*R, R 2, adjusted R 2, and Test of Independence of Residuals of Simple Regression Analysis*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.383 <sup>a</sup>	.146	.141	.97161

Predictors: (Constant), Attitude To Learning Dependent Variable: Reading Comprehension

**Table 6.** Group Statistics

	Gender	N	Mean	Std.	Std. Error
				Deviation	Mean
Reading Comprehension	Female	56	2.3438	1.05876	.14148
	Male	94	2.3183	1.04720	.10801

**Table 7.** Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means		Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
F	Sig.	t	df	Lower	Upper					
Reading Comprehension	Equal variances assumed	.000	.988	.144	148	.886	.02549	.17750	-.32528	.37625
	Equal variances are not assumed.			.143	114.741	.886	.02549	.17800	-.32710	.37808

Spinath et al., 2014; Zolyomi, 2022), contemporary ID frameworks emphasized that cognitive abilities and motivational variables could operate independently of biological sex (Teimouri et al., 2024). In other words, gender alone might be insufficient to predict L2 achievement, and our findings confirmed that aptitude and attitudes were more robust predictors of reading outcomes than gender.

Regarding the aptitude sub-components, our findings partially diverge from those of Rashvand and Ghorbani (2020), who identified sound-symbol association as the most influential predictor. In our study, vocabulary learning showed the greatest predictive power. This difference can be theoretically justified by considering the task-dependent nature of L2 aptitude effects (Robinson, 2002). Grammatical inferencing, vocabulary

acquisition, and sound-symbol correspondence may contribute differently depending on learners' proficiency level, the type of reading material, and the cognitive demands of the task. For pre-intermediate learners, lexical knowledge may be particularly critical for comprehension, explaining why vocabulary learning emerged as the strongest predictor in our sample.

The observed moderate relationship between learners' attitudes and reading comprehension aligns with theories emphasizing the interplay of affective and cognitive factors in SLA. According to the L2 Motivational Self System (Dörnyei, 2005; 2019), learners' attitudes toward the language influence their effort and engagement in learning activities. Positive attitudes enhance learners' motivation to attend to input, engage in meaning-focused reading, and apply cognitive strategies, thereby indirectly supporting reading achievement. Our results corroborate the findings of Papi (2010), and Al-Hoorie (2018) who reported that positive language learning attitudes significantly predict learning effort and, in some cases, achievement. The moderate effect size in our study may be explained by the interactive influence of cognitive aptitude, which may overshadow affective contributions at the pre-intermediate level.

Finally, the absence of significant gender differences in reading achievement is theoretically consistent with the notion that L2 success is mediated more by cognitive aptitude and learning attitudes than by biological sex (Skehan, 2002; Teimouri et al., 2024). Although previous studies reported the gender advantage favoring females in reading attitudes and performance (Kush et al., 2005; Lai, 2007; McKenna, 2001; McKenna et al., 2012), our findings suggested that when cognitive aptitude and task-specific factors were accounted for, gender differences were diminished.

In sum, the results of this study are well-grounded within SLA theory and the framework of individual differences. Learners' cognitive aptitude emerges as a primary determinant of reading comprehension, attitudes exert a moderate but meaningful influence, and gender is not a decisive factor. These findings highlight the importance of integrating both cognitive and affective variables when examining L2 reading outcomes and provide theoretical justification for instructional interventions that consider learners' aptitude profiles and motivational characteristics.

## 6. CONCLUSION

The current investigation delved into scrutinizing the correlation between aptitude, attitude, and gender and their effects on Iranian EFL learners' reading achievement. The study's findings divulged a significant association between the learners' aptitude and their ability to comprehend the reading material. However, such a relationship was not that much significant with reference to participants' attitudes. The results further revealed that gender did not demonstrate a statistically significant relationship with the reading achievements of the learners.

The findings have important implications for the language teaching and learning field. The study highlights the significance of measuring both the predictor variable (aptitude) and the outcome variable (learning gains) in future research, which could help develop and implement effective instructional strategies. Furthermore, recognizing and considering learners' attitudes

and potential impact on language learning can lead to a better understanding and adjustment of instructional assumptions. Moreover, educators are recommended not to take gender differences into account while designing language learning syllabi.

The researchers acknowledge that certain limitations within the present study have made certain aspects of the subject matter remain relatively unexplored. Specifically, the study constrained its scope by involving just 150 individuals. Hence, other studies can be managed by a well-established organization with a more extensive scope involving more participants. The study's participants consisted of pre-intermediate EFL learners, which resulted in a limited range and diversity among the participants. Furthermore, it is crucial to acknowledge that the study's findings are limited in their generalizability, as they are specific to the context of Iran. Consequently, further research is fundamental to examine whether the results would vary when the study is replicated in different contexts. Additionally, some other ID variables, such as motivation, personality traits, learning strategies, etc., as well as some other skills/components, including speaking, listening, and writing are recommended to be explored in future studies as they might change the results significantly.

### Authors' contributions

All authors have contributed equally to prepare the paper.

### Availability of data and materials

The data that support the findings of this study are available from the corresponding author, upon reasonable request.

### Conflict of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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