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The Effect of Test Anxiety on Vocabulary Test Performance among Iranian EFL Elementary Learners: The Role of Gender and Age

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ABSTRACT

Over the past decade, extensive research has shown substantial growth in the desire to examine vocabulary acquisition, significantly contributing to language development. Although the effects of test anxiety can create a significant barrier, hindering English as a Foreign Language (EFL) learners' potential, there is a paucity regarding vocabulary acquisition and test anxiety. This study explores the impact of test anxiety on vocabulary test performance among Iranian EFL learners, focusing on gender and age differences. Using a quantitative approach, the study employed Spielberger's Test Anxiety Inventory (1970) and Nation's Vocabulary Size Test (2007) to assess the relationship between anxiety and vocabulary proficiency. The sample consisted of 63 elementary EFL students—30 males and 33 females—aged 10 to 17, divided into two age groups: children (10-13) and adolescents (14-17). The study examined how test anxiety correlates with vocabulary size through linear regression and ANOVA and whether gender or age differences influenced this relationship. The results revealed a significant negative correlation between test anxiety and vocabulary scores, suggesting that higher anxiety levels are linked to lower vocabulary proficiency. However, ANOVA analysis found no significant differences between males and females, or across the two age groups, regarding anxiety or vocabulary acquisition. The implications of the findings highlight the need for educational strategies that address test anxiety and promote vocabulary development, creating a supportive and inclusive learning environment for all EFL learners. The findings contribute to the increasing research on test anxiety as a hindrance to vocabulary development.

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1. Introduction

Vocabulary performance is a fundamental aspect of language learning, particularly in the context of EFL, where learners face a wide range of challenges. As Nation (2023) highlights, vocabulary plays a critical role in language development, with learners needing a substantial vocabulary base to understand and communicate in English effectively. The importance of vocabulary is further underscored by recent research, which stresses that a strong vocabulary is essential for improving reading comprehension, writing proficiency, and overall language fluency (Asadi & Ebadi, 2024). However, vocabulary development is gradual and incremental, involving regular exposure to the exact words in various contexts (Schmitt, 2008). Moreover, Ghazal (2024) emphasizes that vocabulary performance is often the most challenging aspect of language learning, as it directly influences learners' ability to engage with more complex linguistic structures and texts.

Test anxiety is defined as a psychological condition marked by feelings of worry and fear before or during a test, which can significantly hinder language learning progress (Hosseini, 2024). According to Schmitt and Schmitt (2023), test anxiety can negatively impact students' performance on vocabulary tests, hindering their ability to recall and apply learned vocabulary under pressure. This issue is especially critical for EFL learners, who may already struggle with unfamiliar linguistic concepts. Recent studies by Nurjaya et al. (2024) further emphasize that test anxiety, particularly among younger learners, can disrupt cognitive processes, leading to poorer academic outcomes in vocabulary acquisition.

Understanding the interplay between test anxiety and vocabulary performance and how it differs across age groups and genders is essential for developing effective language teaching strategies. As Meara (2023) asserts, addressing emotional barriers such as test anxiety is crucial in facilitating language learning and improving vocabulary retention. Although research indicates that age and gender differences play a key role in how students experience and cope with test anxiety, impacting their academic achievements and overall performance in language acquisition tasks (Skaalvik & Skaalvik, 2020), hindering learners' potential, there is a paucity regarding vocabulary acquisition and test anxiety. Considering Hosseini's (2024) definition of text anxiety and acknowledging these variables in educational practice, this study examined language learning experiences for diverse learner groups. More specifically, the current study was guided by the following research questions:

Q1: How does test anxiety affect vocabulary test performance among Iranian EFL learners?

Q2: Does the relationship between anxiety and vocabulary acquisition vary across different genders and age groups among elementary EFL learners?

2. Literature Review

2.1 The Role of Emotions in Foreign Language Learning

Foreign Language Anxiety (FLA) is defined as "worry and negative emotional reactions aroused when learning or using a second language" (MacIntyre, 1999, p. 27). In foreign language classrooms, anxiety often arises in situations where students are required to communicate in the target language. Anxiety can be seen as an emotional response to a perceived threat to an individual's self-concept, and in foreign language contexts, it manifests as tension and apprehension, particularly related to speaking, listening, and learning (MacIntyre & Gregersen, 2012). The conflicting findings underpin the multifaceted nature of FLA, indicating that various factors can play a significant role in anxiety in language learning; hence, the researchers need to examine how these factors interact and influence anxiety in different groups accordingly.

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The initial exploration into the role of emotions in foreign language learning was advanced by Gardner and Lambert (1972), who primarily focused on the influence of attitudes and motivation. They argued that motivated students develop positive attitudes that significantly enhance language acquisition. However, learning a new language can be challenging for many individuals, often triggering negative emotions. FLA is one of the most persistent negative emotions that has garnered attention from researchers. In foreign language classrooms, students may unknowingly create barriers to their learning due to fears and concerns about their performance and the level of success they expect to achieve (Dewaele & MacIntyre, 2014; Horwitz, 2010). Recent studies have utilized innovative methods to explore the dynamic interaction between motivation and anxiety in language learning, offering valuable insights into how these emotions fluctuate and influence learning outcomes (Zhang et al., 2024).

Recent studies have emphasized the complex nature of FLA and its impact on language acquisition. For instance, Dewaele et al. (2017) explored the dynamic interaction between FLA and Foreign Language Enjoyment (FLE), highlighting how learners often experience both positive and negative emotions simultaneously. Similarly, Bao (2016) found that higher levels of anxiety in EFL learners correlate with lower speaking proficiency, underscoring the significant role of emotional barriers in oral communication. These findings align with the argument that addressing emotional challenges is crucial for fostering a supportive and effective language learning environment.

In addition, Bhattarachaiyakorn and Phettakua (2023) explored English-speaking anxiety among Thai university students, revealing high levels of anxiety related to beliefs about language learning, grammar, and vocabulary, which could further inform strategies to alleviate emotional barriers in speaking tasks. Furthermore, Rohanizadeh et al. (2024) examined the impact of a social, meta-cognitive, and problem-solving skills training package on tackling FLA and vocabulary learning among Iranian epileptic EFL learners, comparing online and traditional learning contexts. Their study provides valuable insights into the potential of targeted interventions in mitigating emotional barriers to language learning. Additionally, Choi and Lee (2023) explored the relationships between positive emotions, such as language learning curiosity and enjoyment, and vocabulary acquisition, emphasizing the positive role emotions can play in enhancing language learning outcomes.

2.2 FLA and Test Anxiety

FLA has been a central focus in language acquisition research, particularly concerning how anxiety disrupts the learning process. Horwitz et al. (1986) were among the first to recognize anxiety's critical role in foreign language classrooms, noting that it can significantly hinder learners' ability to acquire new language skills. Recent studies by Dewaele (2023) and MacIntyre (2024) have expanded this understanding by highlighting the detrimental effects of test anxiety, a form of FLA, on language test performance, particularly in vocabulary acquisition tasks. Meara (2023) suggests that anxiety impedes memory retrieval, which is essential for effective vocabulary retention, particularly in high-stakes testing situations. Furthermore, MacIntyre and Gregersen (2012) emphasize that younger learners are especially vulnerable to the impacts of test anxiety due to their developing cognitive and emotional resilience, underscoring the necessity for targeted interventions to address these challenges. Additionally, Asadi and Ebadi (2024) argue that creating a supportive and low-anxiety environment is vital for enhancing vocabulary acquisition and fostering overall language development.

As vocabulary learning encompasses any intentional activity aimed at committing lexical information to memory (Laufer & Hulstijn, 2001), which requires explicit processes that demand learners' awareness and deliberate efforts (Ender, 2014; Nation, 2001), test anxiety plays a significant role in learners' performances. Emotional barriers often have a disproportionate impact on students' learning. Prior research has further emphasized the significant influence of emotions on the learning process, noting that specific factors trigger FLA.

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For example, MacIntyre and Gardner (2023) suggest that individuals with generalized anxiety are more likely to display anxiety-related behaviors in foreign language classrooms. Additionally, Dewaele et al. (2023) found that learners experience higher levels of FLA and increased enjoyment in language learning environments compared to their peers. These findings highlight the complex nature of emotions in language learning, where positive and negative emotions often coexist and jointly shape the learning experience.

Research has consistently demonstrated that learners tend to have high levels of test anxiety, which in turn can impede their progress in language acquisition (Lindberg et al., 2020; Skaalvik & Skaalvik, 2020). As such, some studies have explored anxiety and its relation with different factors; for instance, Khodadady and Khajavy (2013) explored the relationship between anxiety and motivation in foreign language achievement, showing that anxiety has a significant yet complex impact on learners' academic outcomes, mediated by their motivational levels. Addressing these emotional barriers and ensuring a more suitable representation in language learning environments may help mitigate their effects and create a more equitable space for learning.

2.3 Age and FLA

The complexity of the relationship between age and FLA suggests that age may interact with factors such as educational background, learning context, and personal traits. Some recent studies examine age's role in FLA and present varying findings. Dewaele and MacIntyre (2021) suggested that younger learners tend to experience higher levels of anxiety, possibly due to less cognitive and emotional resilience. However, their study sample was highly educated, and the anxiety levels decreased among participants with advanced degrees (MA or PhD). This suggests that educational background might interact with age, with individuals who have more advanced education levels experiencing less anxiety. This phenomenon may not apply universally, especially in populations where education levels do not necessarily correlate with age.

Contrastingly, Wang et al. (2022) examined university students and found that older learners exhibited higher anxiety levels than their younger counterparts. This high level of anxiety experienced by older learners may be due to increased self-awareness and critical evaluation of their performance, as well as the perfectionist tendencies often found in adult learners, which MacIntyre and Gregersen (2012) also note. In contrast, Dewaele (2020) argued that younger learners, particularly in the early stages of second language acquisition, may experience higher anxiety levels due to the novelty of the learning experience.

These differing results underscore the complexity of the relationship between age and FLA, suggesting that age may interact with factors such as educational background, learning context, and personal traits. Some studies (e.g., Geçkin, 2020; Tercan & Dikilitaş, 2020) suggest that older learners tend to experience higher levels of FLA, while others (Dewaele & MacIntyre, 2021) found that younger learners exhibit more anxiety. These conflicting findings point to the multifaceted nature of FLA, indicating that age alone cannot be considered the sole determinant of anxiety in language learning. Further research is necessary to explore how these factors interact and influence anxiety in different language-learning contexts.

2.4 Gender Differences in FLA and Vocabulary Learning

Gender has long been recognized as a significant factor influencing various educational outcomes, particularly concerning test anxiety and vocabulary proficiency in language learners (Lindberg et al., 2020; Skaalvik & Skaalvik, 2020). While numerous studies have explored the impact of gender on educational achievement, there remains a noticeable gap in examining how gender interacts with test anxiety and vocabulary acquisition, especially among elementary-level EFL learners (Kian & Tohidi, 2024). Addressing this gap is critical for understanding how gender-specific emotional responses may shape language learning outcomes, particularly in contexts where both anxiety and vocabulary proficiency play a central role.

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Research has consistently shown gender differences in educational contexts, with Skaalvik and Skaalvik (2020) noting that females tend to report higher levels of test anxiety than males. In this regard, societal norms and expectations surrounding gender roles can significantly influence learning behaviors and academic outcomes (Lindberg et al., 2020). Building upon this framework, recent studies have emphasized how gender stereotypes and societal expectations shape students' academic performance, motivation, and emotional responses to learning challenges, including test anxiety and vocabulary acquisition (e.g., Kian & Tohidi, 2024). In a related study, Elahi Shirvan et al. (2014) found that test anxiety negatively correlated with academic performance, illustrating emotional factors' critical role in shaping learning outcomes. These findings collectively highlight the intricate ways gender and emotional factors interact to influence language learning processes.

Some recent studies have emphasized the significant role of cultural factors in shaping gender differences in academic performance and motivation. For example, Garcia and Van den Broeck (2017) and Else-Quest et al. (2010) have highlighted how societal norms and expectations related to gender roles can influence students' self-perceptions as language learners and, consequently, their vocabulary acquisition and test preparation strategies. In language learning, gendered classroom interactions and teaching strategies can significantly influence students' academic self-concept and learning behaviors. Additionally, studies by MacIntyre and Gardner (2023) suggest that individuals with higher general anxiety levels are more likely to exhibit anxiety-related behaviors in foreign language classrooms. These findings underscore the complex interplay between gender, anxiety, and language learning, further emphasizing the multifaceted nature of educational experiences shaped by cultural and emotional factors.

Concerning gender differences in FLA, some investigations show that emotional responses affect test-taking behaviors and vocabulary acquisition. Xin (2024) found that second-grade female students experience slightly higher anxiety levels than males, influenced by societal expectations and self-recognition in language learning. However, the levels of FLA and enjoyment can affect their language learning outcomes, which need to be considered, as Dewaele et al. (2023) suggested. The study highlights the need to address gender-specific emotional responses in the classroom, suggesting that a supportive environment can reduce anxiety and improve vocabulary learning for both genders.

Regarding attribution theory, Weiner (1985) provides foundational insights into how gender influences students' attributions of success and failure in educational settings, impacting their emotional responses, such as test anxiety and engagement with language learning tasks. Recent work by Fazio and Olson (2020) extends this discussion by exploring how implicit and explicit attitudes, influenced by attributional processes, affect students' academic outcomes, including their emotional responses to language learning challenges. Building on this, Zhou and Wang (2022), in their meta-analysis, explored how attributions in the language learning process contribute to FLA and self-efficacy, providing valuable insights into how these factors, alongside gender, influence language acquisition and test performance in EFL contexts. These theoretical perspectives and empirical findings highlight the significance of addressing gender-related and emotional dimensions in language learning research.

Overall, the intricate relationships between emotional factors, such as anxiety, and demographic variables, like gender and age, highlight the importance of further investigation into their combined effects on language acquisition. Despite extensive research, there remains a need for more precise studies to explore how these factors interact across diverse educational contexts. Future research should aim to identify effective strategies for mitigating FLA and creating more equitable learning environments for all learners, particularly concerning vocabulary acquisition and test performance.

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3. Method

3.1 Participants

The study involved 63 elementary-level Iranian EFL learners aged 10-13 and 14-17 recruited from a language institute in Ardabil, Iran. The sample comprised 45 children (aged 10-13) and 18 adolescents (aged 14-17). The participants were selected based on their pre-determined proficiency levels, which were assessed during their registration at the language institute. They were randomly selected and assigned to the study based on these proficiency levels. They were considered homogenous in terms of English proficiency level. The gender distribution was somehow balanced, with 30 male and 33 female participants. Before the study, all participants were thoroughly informed about the study's objectives, methodology, and ethical considerations. This ensured that they understood the purpose of the study and their rights as participants.

3.2 Materials

This study facilitated data collection through two key instruments: the Test Anxiety Inventory (TAI) and the Vocabulary Size Test (VST). The TAI consists of 40 items designed to assess the cognitive and emotional dimensions of test anxiety experienced by the participants. For each item, respondents indicated their level of agreement on a 5-point Likert scale, ranging from 1 (Strongly Agree) to 5 (Strongly Disagree).

The reliability of the TAI was evaluated using Cronbach's Alpha coefficient. As shown in Table 1, the Cronbach's Alpha for the questionnaire was 0.925, which exceeds the commonly accepted threshold of 0.7, indicating high internal consistency. Furthermore, Cronbach's Alpha based on standardized items was 0.926, further confirming the reliability of the questionnaire. With 40 items, the TAI demonstrates strong reliability, suggesting it consistently measures the intended construct of test anxiety across its various dimensions.

Table 1. Reliability statistics for anxiety questionnaire

Reliability Statistics		
Cronbach's Alpha	**Cronbach's Alpha Based on Standardized Items**	**N of Items**
.925	.926	40

The second instrument employed, the Vocabulary Size Test (VST), was developed by Paul Nation and David Beglar (2007) based on the British National Corpus (BNC). This test consists of 14 levels, with each level corresponding to the knowledge of 1,000-word families, ranging from the most frequent word families in the 1st level to the least frequent ones in the 14th level. Due to time constraints, a condensed version of the VST, comprising 80 multiple-choice items, was utilized in this study. Each level was represented by 10 items, encompassing 1,000-word families.

Data analysis was conducted using statistical software packages, such as SPSS (Statistical Package for the Social Sciences). These tools enabled the calculation of descriptive statistics (e.g., mode, mean scores, standard deviations) and inferential statistics (e.g., correlation analysis, regression analysis, ANOVA, and Levene's Test). These analyses examined the relationships between test anxiety and vocabulary size comprehensively.

Overall, the materials utilized in this study played a pivotal role in assessing the impact of test anxiety on the vocabulary size of Iranian male and female EFL elementary learners. These instruments not only facilitated data collection but also enabled the analysis of results, providing valuable insights into the influence of anxiety on language learning outcomes.

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3.3 Data Collection Procedure

The data collection procedure for this study involved gathering information from elementary EFL learners enrolled in an English language institute in Iran. A total of 63 students, including 30 males and 33 females, participated in the research. The participants consisted of 45 children aged 10-13 and 18 adolescents aged 14-17. They were selected based on proficiency levels and parental consent, using a random sampling approach from the pool of students enrolled in the institute.

The Test Anxiety Inventory (TAI), a validated self-report questionnaire designed for elementary-level learners, was used to evaluate test anxiety levels, . This inventory consisted of 40 Likert-scale items to assess various dimensions of test anxiety, such as concerns about performance, physiological reactions, and cognitive interference. Vocabulary size was assessed using the Vocabulary Size Test (VST), a widely used standardized tool for determining receptive vocabulary size among elementary-level learners. The test presented participants with a series of English words and their corresponding definitions, and they were asked to select the correct definition for each word from a provided list of options.

Data collection occurred during regular class hours. Participants completed both the TAI and VST assessments in their respective classrooms under the supervision of trained researchers. The time allocated for each assessment was approximately 50 minutes for the TAI and 90 minutes for the VST. The assessments were administered in a standardized manner to ensure consistency across all participants.

3.4 Data Analysis

First, the descriptive analysis was measured, and the data had equal variances, which were normally distributed, and no extremes or outliers. However, descriptive analysis cannot solely show if the relationships are statistically significant; hence, inferential statistics were employed. Then, the researchers checked the assumptions of ANOVA through Levene's Test of Equality of Error Variances, which indicates that the homogeneity of variances is not statistically significant, meaning that this assumption is not violated because the Sig values are larger than the cut-off of .05.

4. Results

Based on the information in Table 2, the average age of the participants is 12.78 years, with a standard deviation of 2.239. The median and mode indicate that the most frequent age is 12. The average score of the participants on the vocabulary test is 45.05, with a standard deviation of 17.899. The mean score was 45.05, with a standard error of 2.255. The median score was 44.00. The standard deviation for scores was 17.899, and the variance was 320.369. The skewness value of 0.337 indicates a slight positive skew, and the kurtosis value of -0.893 suggests a slightly less peaked distribution than a normal distribution.

The average anxiety level of the participants is 2.6825, with a standard deviation of 0.74857. The median anxiety level was 2.7250. The skewness value of -0.244 indicates a slight negative skew, and the kurtosis value of -0.676 suggests a distribution with a slightly flatter peak and shorter tails compared to a normal distribution.

From this data, it can be inferred that most participants are quite young, and there is variability in both vocabulary scores and anxiety levels. However, more detailed and cumulative statistical analyses are needed to examine the relationships between these variables.

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Table 2. Descriptive statistics

		age	Score	Anxiety
N	**Valid**	63	63	63
	Missing	0	0	0
Mean		12/778	45.05	2.6825
Std. Error of Mean		0/282	2.255	.09431
Median		12/000	44.00	2.7250
Mode		12/000	27[a]	2.70[a]
Std. Deviation		2/239	17.899	.74857
Variance		5/014	320.369	.560
Skewness		1/730	.337	-.244
Std. Error of Skewness		0/302	.302	.302
Kurtosis		5/727	-.893	-.676
Std. Error of Kurtosis		0/595	.595	.595
Range		13/000	64	2.97
Minimum		10/000	15	1.20
Maximum		23/000	79	4.18
Sum		805/000	2838	169.00

Based on the statistical analysis provided in Table 3, the data distributions for both the "Score" and "Anxiety" variables appear to exhibit characteristics of normal distributions. The skewness ratio to the standard error of skewness for both variables falls within the acceptable range of -2 to +2. Specifically, the ratio is 1.118 for "Score" and -0.810 for "Anxiety". Similarly, the ratio of kurtosis to the standard error of kurtosis also falls within the acceptable range, with -1.500 for "Score" and -1.137 for "Anxiety". These findings suggest the data are symmetrically distributed around the mean, with no significant outliers or extreme deviations from the normal distribution. Therefore, based on these statistical indicators, it can be concluded that the distributions of scores and anxiety in the dataset are approximately normal.

Table 3. Normality of data distribution for scores and anxiety

Statistics			
		Score	**Anxiety**
N	**Valid**	63	63
	Missing	0	0
Skewness/Std. Error of Skewness		1.118	-0.810
Kurtosis/ Std. Error of Kurtosis		-1.500	-1.137

Based on the Pearson correlation coefficient provided in Table 4, there is a statistically significant relationship between the variables "Score" and "Anxiety" ($r = 0.262$, $p = 0.038$, $N = 63$). The significance level (p-value) of 0.038 indicates that the correlation observed is unlikely to have occurred by random chance alone, as it is less than the commonly accepted threshold of 0.05. However, the strength of this relationship is considered weak, given the magnitude of the correlation coefficient ($r = 0.262$). Therefore, while there is a significant association between scores and anxiety levels, it is important to note that this relationship is relatively weak.

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Table 4. Pearson correlation analysis between scores and anxiety

Correlations			
		Score	**Anxiety**
Score	Pearson Correlation	1	.262*
	Sig. (2-tailed)		.038
	N	63	63
Anxiety	Pearson Correlation	.262*	1
	Sig. (2-tailed)	.038	
	N	63	63

*. Correlation is significant at the 0.05 level (2-tailed).

The Model Summary table provides an overview of the linear regression model applied to the data (Table 5). The R Square value, also known as the coefficient of determination, measures the proportion of variance in the dependent variable (Score) explained by the model's independent variable (Anxiety). In this case, the R Square value is 0.069, indicating that the variance in anxiety levels can account for approximately 6.9% of the variance in the scores.

In other words, about 6.9% of the variability observed in the scores of the participants can be attributed to the levels of anxiety they experience. While this indicates that there is some degree of association between anxiety levels and scores, the majority of the variability in scores remains unexplained by anxiety alone. Therefore, while anxiety contributes to the variability in scores to some extent, other factors beyond anxiety likely influence the participants' scores in this context.

Table 5. Model summary for simple linear regression analysis

Model Summary[b]				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.262[a]	.069	.054	17.413

a. Predictors: (Constant), Anxiety
b. Dependent Variable: Score

Table 6 shows the results of the simple linear regression analysis, with "Score" as the dependent variable and "Anxiety" as the predictor variable. In this analysis, the "Regression" row indicates that the predictor variable "Anxiety" explains a significant portion of the variance in the dependent variable "Score." Specifically, the sum of squares for regression is 1366.686, with 1 degree of freedom, resulting in a mean square of 1366.686. The associated F statistic is 4.507, and the p-value (Sig.) is 0.038. Since this p-value is less than the conventional significance level of 0.05, the regression model is deemed statistically significant, suggesting that "Anxiety" significantly predicts the variation in "Score."

On the other hand, the "Residual" row represents the unexplained variance in the dependent variable "Score" after accounting for the predictor variable "Anxiety." The sum of squares for residuals is 18496.172, with 61 degrees of freedom, resulting in a mean square of 303.216. The F statistic is not applicable because there is no predictor variable in the residual component.

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Overall, the ANOVA table indicates that the regression model, including "Anxiety" as a predictor, is statistically significant ($p = 0.038 < 0.05$), implying that "Anxiety" significantly predicts the variation in "Score" among the participants in the study.

Table 6. ANOVA table for simple linear regression analysis

ANOVA[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	1366.686	1	1366.686	4.507	.038[b]
	Residual	18496.172	61	303.216		
	Total	19862.857	62			

a. Dependent Variable: Score
b. Predictors: (Constant), Anxiety

Based on the coefficients in Table 7, both the intercept (Constant) and the coefficient for Anxiety are statistically significant ($p < 0.05$). This suggests that Anxiety has a significant effect on the scores of students. Specifically, for every one-unit increase in Anxiety, there is a corresponding increase of 6.272 points in the score. The intercept indicates that the predicted score is 28.223 when Anxiety is zero. Therefore, the regression equation relating Anxiety to the scores of students can be expressed as:

Score = 28.223 + (6.272 * Anxiety).

This equation highlights the linear relationship between Anxiety and the scores of students, indicating that higher levels of Anxiety are associated with higher scores.

Table 7. Regression coefficients

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	28.223	8.223		3.432	.001
	Anxiety	6.272	2.954	.262	2.123	.038

a. Dependent Variable: Score

Regarding the influence of gender and age on the relationship between anxiety and vocabulary test performance in elementary EFL learners, Levene's Test of Equality of Error Variances (Table 8) whether the variances of the dependent variable (Score) are equal across groups formed by the factors included in the model, such as Anxiety, Gender, Age, and their interactions. The test's null hypothesis assumes that the variances are equal across groups.

For the test statistic "Based on Mean," the p-value (Sig.) is 0.143, greater than the commonly accepted threshold of 0.05. As a result, we fail to reject the null hypothesis, meaning there is no significant evidence to suggest unequal error variances across groups. This supports the assumption of homogeneity of variances. Therefore, it is appropriate to proceed with further analyses (ANOVA or regression) to assess whether there are significant differences in the effect of anxiety on grades according to age, gender, and students.

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Table 8. Levene's test of equality of error variances

Levene's Test of Equality of Error Variances[a,b]					
		Levene Statistic	**df1**	**lf2**	**Sig.**
Score	Based on Mean	2.251	6	8	.143
	Based on Median	.927	6	8	.523
	Based on Median and with adjusted df	.927	6	2.000	.602
	Based on trimmed mean	2.137	6	8	.158

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.
a. Dependent variable: Score
b. Design: Intercept + Anxiety + Gender + Age + Anxiety * Gender + Anxiety * Age + Gender * Age + Anxiety * Gender * Age

Concerning the interaction between gender and anxiety, the significance level (Sig.) for the interaction term "Anxiety * Gender" is 0.777, much greater than the commonly accepted threshold of 0.05. This indicates that the interaction between gender and anxiety does not have a statistically significant impact on scores. Therefore, the influence of anxiety on scores does not differ significantly between male and female participants. On the other hand, the significance level (Sig.) for the interaction term "Anxiety * Age" is 0.367, which again exceeds 0.05. This suggests that there is no significant difference between age groups (children vs. teenagers) in terms of the relationship between anxiety and scores.

Table 9. Tests of between-subjects effects

Tests of Between-Subjects Effects
Dependent Variable: Score

Source	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**	**Partial Eta Squared**
Corrected Model	17243.190[a]	54	319.318	.975	.571	.868
Intercept	109973.978	1	109973.978	335.841	.000	.977
Anxiety	15068.589	47	320.608	.979	.567	.852
Gender	472.033	1	472.033	1.442	.264	.153
Age	150.000	1	150.000	.458	.518	.054
Anxiety * Gender	28.033	1	28.033	.086	.777	.011
Anxiety * Age	1007/200	3	335/733	0/579	0/668	0/367
Gender * Age	.000	0	.	.	.	.000
Anxiety * Gender * Age	.000	0	.	.	.	.000
Error	2619.667	8	327.458			
Total	147708.000	63				
Corrected Total	19862.857	62				

a. R Squared = .868 (Adjusted R Squared = -.022)

Overall, the analysis reveals a statistically significant but weak correlation between EFL learners' anxiety levels and vocabulary test scores. Although anxiety has some predictive value for vocabulary acquisition scores, the overall explanatory power is limited. Furthermore, neither gender nor age significantly moderates this relationship, suggesting that other factors may contribute to the observed variance in vocabulary scores. These

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findings offer valuable insights into the dynamics of anxiety in language learning, although future research should explore additional variables that could influence vocabulary acquisition.

5. Discussion

The results of the study emphasize the significant relationship between test anxiety and vocabulary performance in elementary EFL learners. Pearson correlation analysis revealed a statistically significant association between test anxiety and vocabulary scores, with a p-value of 0.038. This result indicates that anxiety can noticeably influence vocabulary performance, but the correlation coefficient of 0.262 suggests the relationship is relatively weak. These findings highlight the complexity of vocabulary acquisition, where anxiety is one of several factors that can influence learners' performance. While anxiety is an important variable, it is likely that other cognitive, emotional, and pedagogical factors also play a role in vocabulary acquisition.

These findings are consistent with recent studies in second language acquisition. For instance, Asadi and Ebadi (2024) found that language anxiety significantly affects learners' academic performance, particularly in vocabulary acquisition contexts. Their study demonstrated that anxiety leads to cognitive overload, impairing learners' ability to retrieve and use vocabulary effectively during assessments. Similarly, Nurjaya et al. (2024) showed that test anxiety negatively affects language learners' ability to engage with new vocabulary, especially in high-pressure test environments. Their research suggested that anxiety impairs working memory, which is critical for vocabulary retention and application. Furthermore, the study by Alan (2023) examined the emotional experiences of multilingual learners, suggesting that language anxiety interferes with learners' motivation to participate in language learning activities. This aligns with our findings, suggesting that anxiety hampers vocabulary test performance, possibly by affecting students' ability to fully engage with the material. In line with the current study, Zeng and Wang (2024) revealed that learners with higher levels of test anxiety tend to avoid vocabulary-related tasks, which further exacerbates their vocabulary deficits; namely, these findings reinforce that test anxiety impedes effective vocabulary learning.

However, it is important to note that the weak correlation between anxiety and vocabulary performance in this study suggests that other factors, such as learners' motivation, previous language exposure, and the quality of instructional methods, may have an equally strong or even stronger influence on vocabulary acquisition. Hence, it is essential to identify various factors impeding language learning to foster positive learning environments. For instance, Dewaele and Dewaele (2017) suggested that understanding the dynamic interaction between FLA and Foreign Language Enjoyment (FLE) is essential for designing interventions to provide effective learning situations. Another study by Wang and Liu (2024) has suggested that intrinsic motivation and the use of engaging, interactive learning methods can significantly mitigate the negative effects of anxiety on vocabulary acquisition. Similarly, Bao (2016) highlighted that while anxiety negatively impacts EFL learners' speaking proficiency, strategic behaviors, and well-structured instructional approaches can alleviate these effects. In line with this, Dewaele and MacIntyre (2014) emphasized the duality of emotional experiences in the foreign language classroom, where enjoyment and anxiety coexist, influencing learners' performance. These findings underscore the multifaceted nature of foreign language learning and the importance of addressing emotional, motivational, and methodological dimensions to optimize vocabulary acquisition.

Regarding the influence of gender and age on the relationship between anxiety and vocabulary test performance, the study found that there was no significant interaction between gender or age and the impact of anxiety on vocabulary test scores. In other words, anxiety's effect on vocabulary test performance did not vary considerably between male and female learners or across different age groups. These findings are intriguing, given that gender and age have often been proposed as important moderators in the relationship between anxiety and

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language learning outcomes. The consistency of anxiety's effect across both gender and age groups in this study is also corroborated by recent research by Gao and Zuo (2024), which found that language anxiety's impact on vocabulary acquisition is largely uniform, regardless of gender or age. This suggests that anxiety is a universal emotional experience that affects learners similarly, irrespective of demographic factors. As such, this study supports the growing body of literature that emphasizes the need for comprehensive strategies to address anxiety in language learning, strategies that do not rely on gender or age-specific approaches.

Recent studies have found that gender can influence the way learners experience and cope with anxiety, though its effect on language performance remains ambiguous. For example, Dewaele (2023) explored how gender affects language learners' anxiety levels, finding that while females generally report higher anxiety, the impact on their language skills, particularly vocabulary acquisition, was not significantly different from that of males. Similarly, Elahi Shirvan et al. (2014) noted that although females tended to report higher anxiety levels, this did not translate into poorer performance in language tasks, suggesting that other factors, such as coping strategies or language proficiency, could moderate the effect of anxiety on language learning. In addition, Xin (2024) found similar gender differences in vocabulary learning anxiety among second-grade students, with female students experiencing slightly higher anxiety levels. However, this did not appear to significantly hinder their vocabulary acquisition, suggesting that external factors such as self-recognition and societal expectations play a key role in shaping learners' emotional responses.

Age has also been proposed as a factor influencing the relationship between anxiety and language acquisition. According to Gao and Zuo (2024), older learners tend to have better mechanisms for coping with language learning anxiety due to their greater maturity and experience. However, their study found that anxiety still negatively impacted vocabulary performance, though not significantly more than in younger learners. These studies support the view that age does not substantially alter the effect of anxiety on vocabulary acquisition. As proposed by MacIntyre and Gardner (2024), older learners may experience anxiety differently, while its effect on language performance remains stable across age groups. Our study supports this argument, as no significant age-related differences were observed in anxiety-related vocabulary test scores. As a result, the absence of significant gender differences in the effect of anxiety on vocabulary tests suggests that the focus of anxiety interventions should not be gender-specific. Instead, it should center on reducing anxiety for all learners, regardless of gender, through universal strategies. Techniques such as mindfulness practices, relaxation exercises, and anxiety management training can be effective for all learners (Dewaele, 2023). Additionally, reducing test-related anxiety through formative assessments and feedback can foster a more supportive and inclusive learning environment for all students.

6. Conclusion

The results of this study indicate that test anxiety significantly affects vocabulary performance, although the effect is relatively weak, highlighting the complexity of the vocabulary learning process. Anxiety was identified as one of the influencing factors, but it cannot be considered the primary one, as other cognitive, emotional, and pedagogical factors also play a role. Moreover, the lack of significant differences between genders and age groups in the impact of anxiety on vocabulary learning, particularly in test scenarios, suggests that anxiety is a universal phenomenon affecting most language learners' performances. This underscores the importance of implementing anxiety-reduction strategies at the classroom level, focusing on methods that address all learners, regardless of gender or age. Additionally, the study's limitations, such as the small sample size and reliance on cross-sectional data, emphasize the need for further research and the use of more precise measurements better to understand the complex relationships between anxiety and language learning.

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The findings of this study contribute to the theoretical understanding of language learning by emphasizing the pervasive role of test anxiety across various learner demographics. One key takeaway is that test anxiety impacts vocabulary test performance similarly across both gender and age groups, highlighting that anxiety is a universal emotional experience in language learning. This supports the view that language learning theories should account for anxiety as a common factor that can affect all learners, regardless of their gender or age. Additionally, the results align with cognitive theories of anxiety, suggesting emotional states like anxiety can significantly influence learners' ability to process and recall information. As observed in this study, anxiety's impact on vocabulary acquisition further emphasizes the need for theoretical frameworks that integrate emotional and psychological variables into the language learning. This underscores the necessity of incorporating strategies to address anxiety in language acquisition models to enhance academic outcomes and learner well-being.

From a practical perspective, the study's findings have several implications for language educators. First, recognizing the universal impact of anxiety across different groups highlights the need for educational strategies that address this challenge comprehensively. It suggests that interventions should not be tailored solely based on demographic factors such as gender or age but rather be designed to help all learners manage anxiety in a way that enhances their learning experience.

Employing interactive and engaging teaching methods, such as vocabulary games, multimedia resources, and contextualized language exercises, teachers can help learners feel more motivated and reduce anxiety by making the learning process more enjoyable. By fostering a supportive classroom environment that promotes collaboration, constructive feedback, and peer interaction, educators can effectively reduce the negative impact of anxiety and enhance students' learning outcomes. In other words, teachers should consider implementing anxiety-reduction techniques such as mindfulness exercises, deep breathing, or relaxation strategies during lessons to provide a positive and supportive classroom atmosphere, thereby reducing anxiety and improving vocabulary performance. It is essential for educators to create an environment where learners are encouraged to engage with the material without the fear of judgment or failure.

While this study provides valuable insights, several limitations need to be acknowledged. First, the sample size was relatively small and limited to elementary EFL learners in Iran. Therefore, the findings may not be generalizable to other contexts or populations. Future research should consider larger, more diverse samples from different geographical regions and cultural backgrounds to increase the external validity of the results. Additionally, the study utilized a cross-sectional design, examining only a snapshot of the learners' anxiety levels and vocabulary performance at one point. Longitudinal studies that track the impact of test anxiety on language acquisition over an extended period would provide more comprehensive insights into how anxiety affects learners in the long run. Another limitation is the reliance on self-reported measures to assess anxiety, which may be subject to response biases. Future research should incorporate more objective tools, such as physiological measures (e.g., heart rate or cortisol levels), to provide a more accurate picture of the impact of anxiety on language learning.

Future research should explore test anxiety's impact on a broader range of language skills beyond vocabulary acquisition, such as reading, writing, and speaking proficiency. Investigating the relationship between anxiety and different language skills can provide a more holistic understanding of how anxiety affects overall language proficiency. Moreover, it would be valuable to examine the role of individual differences, such as personality traits, cognitive styles, or learning strategies, in moderating the relationship between test anxiety and language learning. For example, some learners may have developed effective coping strategies that mitigate the impact of anxiety, while others may struggle more with its effects. By identifying these individual differences, educators can design more personalized interventions that cater to the unique needs of each student. Further research could investigate the effectiveness of specific anxiety-reduction interventions tailored to language learners. Exploring

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various approaches, such as cognitive-behavioral techniques, relaxation exercises, or social-emotional learning programs, could help identify the most effective methods for reducing anxiety and improving language learning outcomes. Lastly, longitudinal studies that track learners' progress over time and assess the long-term impact of anxiety reduction strategies on language acquisition would provide valuable insights. These studies could reveal whether interventions to reduce anxiety have lasting effects on learners' motivation, engagement, and performance in language learning contexts.

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