# Exploring the Predictive Factors and Sources in English Reading Anxiety from Individual Differences, Grammar Perspectives and Vocabulary Perspectives for Chinese Undergraduates

**Ying Huang[1,†], Nanxuan Li[2,*,†], and Shurui Xiang[3,†]**

[1] *Faculty of Foreign Languages, Guangdong Ocean University, Zhanjiang, Guangdong 524000, China*

[2] *Faculty of Arts and Humanities, University of Southampton, Southampton SO17 1BJ, England*

[3] *School of International Studies, Shaanxi Normal University, Xi'an, Shanxi 710000, China*

[†]*These authors contributed equally*

*Corresponding author: Nanxuan Li, E-mail:* 19184631323@163.com*.*

## Abstract

Anxiety is a negative emotion that may influence reading performance. The purpose of this study was to investigate the predictive effects of individual differences on Chinese undergraduate students' English reading anxiety and differences in grammar and vocabulary. The predictive effects of gender, major category, grade level, and current level of English proficiency were explored at the individual level. Word comprehension anxiety, word pronunciation anxiety and grammar anxiety are three sources of English reading anxiety. A total of 247 questionnaires were collected in this study, of which 207 were valid. A quantitative methodology was used in this research to handle the data. A multiple linear regression model was used to investigate these predictive factors, and it was found that gender, major category, and grade had no significant effect on Chinese college students' English reading anxiety, whereas the current level of English proficiency had a significant and uneven effect on English reading anxiety. For anxiety resources, Pearson correlation was used to explore the relationships between total reading anxiety scores and word comprehension anxiety, word pronunciation anxiety, and grammar anxiety to identify their ranks. The results of the study revealed that word comprehension anxiety was the most dominant of the three sources of anxiety, followed by grammar anxiety and word pronunciation anxiety. This study also discusses the reasons for these findings and provides pedagogical suggestions for teachers on how to tailor their teaching to the needs of their students, choose appropriate textbooks, and balance the weighting of grammar and vocabulary in English reading, which has a positive effect on the field of foreign language emotion research.

## Keywords

English reading anxiety, individual differences, grammar, vocabulary

## 1. Introduction

### 1.1 Research Background

Foreign language learning is a complex cognitive and affective process in which foreign language reading anxiety (FLRA) is one of the important psychological factors affecting learning. Saito et al. (1999) noted that FLRA refers to the nervousness, fear, or uneasiness that a learner experiences when reading a foreign language, which may hinder reading comprehension and further affect the overall language acquisition process. They also indicated that foreign language reading anxiety is different from general foreign language anxiety in that difficulty in vocabulary and grammar comprehension is the main factor and sets up relevant items in the scale. English has become an important tool for international communication, academic research and professional development. Therefore, many universities in China require students to master a certain level of English proficiency to adapt to the needs of academic research, overseas exchanges, and future competition in the workplace, which makes the study of English in the undergraduate education stage pivotal, and at the same time, the popularization of the College English Test Band 4 (CET-4) and College English Test Band 6 (CET-6) of college English in colleges and universities requires that students be exposed to English reading. Students with English majors must participate in the Test for English Majors Band 4 (TEM-4) and the Test for English Majors Band 8 (TEM-8). However, in the actual learning process, many undergraduate students experience varying degrees of anxiety when reading English texts, a phenomenon known as English reading anxiety. Reading anxiety not only affects students' comprehension of the text but also may reduce their interest and self-confidence in learning, thus further hindering the improvement of English proficiency. Individual differences may influence how learners respond to linguistic input while reading, leading to different levels of anxiety. Therefore, exploring the effects of individual differences as predictors of English reading anxiety is highly valuable and practical. Teachers are able to reduce English reading anxiety by developing target-specific teaching methods on the basis of individual differences. Vocabulary and grammar are the two core elements for understanding the meaning of a text. However, many Chinese students believe that they can do well in English as long as they have enough vocabulary, ignoring the negative emotional impact if they are unable to understand grammar. Therefore, distinguishing which one is more likely to trigger reading anxiety not only helps to deepen the understanding of the mechanisms of reading anxiety but also has important practical significance for the optimization of foreign language teaching and anxiety intervention strategies.

### 1.2 Literature Review

At present, there have been a number of studies on students' English reading anxiety in China and abroad, but relatively few studies have been conducted on Chinese undergraduates, and almost few studies have explored the effects of individual differences and the differences in sources from the word and grammar perspectives on English reading anxiety. Chen et al., (2022) reported that learning attitudes are predictive factors of reading anxiety among EFL undergraduates. Miao and Vibulphol (2021) reported that Chinese college students lacked general reading ability and vocabulary skills, which resulted in English reading anxiety. Research on Chinese college students' English reading anxiety has paid little attention to the effects of individual background differences and language knowledge factors on students' English reading anxiety . Ying (2022) noted that students' reading anxiety has a significant effect on their English performance. In a study of Saudi Arabian students, Zemni and Alrefaee (2020) reported that unknown vocabulary, pronunciation difficulties, unfamiliar topics, and new words were the highest sources of anxiety. Hamada and Takaki (2022) noted that individual differences in orthographic characteristics and writing systems had a smaller effect on L2 reading anxiety, whereas class rank had a greater effect on L2 reading anxiety. Al-Obaydi et al. (2024) reported that good teacher–student relationships could reduce reading anxiety. Karamina et al. (2024) suggested that students' reading anxiety was triggered by unfamiliar topics, fear of making mistakes, concern about the effects of reading anxiety, and foreign cultures. Zheng (2024) indicated that chatbots could significantly reduce students' reading anxiety. Li et al. (2024) noted that highly anxious readers of foreign languages allocate their attention inefficiently while reading. Research on the influence of individual differences and vocabulary and grammar as sources on Chinese undergraduate students' English reading anxiety is lacking. Some studies have selected only students from a certain university in China, which is not representative of the whole country. In the analysis of sources of anxiety, few studies have used correlation analysis to explore the sources. The mean of descriptive statistics is used more often, but it is

susceptible to the influence of extreme values. Explorations of the predictive impact of individual differences via multiple linear regression models have also rarely been performed. Most studies of individual difference factors use descriptive analysis, t tests or analysis of variance (ANOVA) to analyse data.

### 1.3 Purposes of the Study and Questions

This study seeks to determine the predictive effect of individual differences, including gender, major in English, grade level, and English proficiency level, on English reading anxiety and explore the differences in three sources of anxiety, namely, word comprehension anxiety, word pronunciation anxiety and grammar anxiety. The data were analysed in detail via a multiple linear regression model and Pearson correlation. Multiple linear regression models provide a measure of how much each independent variable affects the dependent variable through regression coefficients. The regression coefficients reveal which factor is more important for individual differences. Pearson's correlation explores the overall correlation and is not susceptible to extreme values. The reasons and countermeasures are then discussed in response to the findings. The following research questions were addressed to fulfil the purposes of the study:

(1) What are the predictive effects of individual differences, including gender, major category, grade level, and current level of English proficiency, on Chinese undergraduates' English reading anxiety?

(2) Which source of anxiety among word comprehension anxiety, grammar anxiety and word pronunciation anxiety contributes more to the degree of English reading anxiety?

## 2. Theoretical Framework

### 2.1 Foreign Language Anxiety Theory

In 1986, Horwitz et al., (1986) stated that foreign language anxiety is a unique and complex synthesis of self-knowledge, beliefs, emotions and behaviors related to classroom language learning. Tran (2012) stated that foreign language anxiety is separate from general anxiety and that there is a significant relationship between FLA and foreign language proficiency, whereas only a weak relationship exists between general anxiety and foreign language proficiency. Foreign language anxiety is a context-specific anxiety uniquely related to the experience of learning a foreign language. Dewaele and MacIntyre (2014) noted that participants who were already multilingual, had achieved higher levels in the Foreign Language (FL), felt more proficient than their peers, had attained a higher level of education, and were older reported significantly higher levels of Foreign Language Enjoyment (FLE) and significantly lower levels of Foreign Language Classroom Anxiety (FLCA). Additionally, female participants reported higher levels of both FLE and FLCA than males did, implying that females are more emotional than males are. These studies and theories suggest that gender, age, education level, and English proficiency may be factors that influence foreign language anxiety. Saito et al. developed the concept of foreign language reading anxiety (FLA) and the Foreign Language Reading Anxiety Scale (FLRAS) in 1999.

### 2.2 Cognitive Load Theory

The cognitive load theory developed by Sweller and colleagues argues that many traditional instructional techniques do not adequately consider the limitations of the human cognitive architecture because they unnecessarily overload the learner's working memory, which is the central "bottleneck" of his/her cognitive system. Therefore, cognitive load theory attempts to integrate knowledge about the structure and function of the human cognitive system with instructional design principles. With respect to the acquisition and teaching of a second language, Sweller (2017) stated that students learning a second language constantly process new information. A sentence that can be easily parsed in the native language may impose an incredibly high working memory load in the second language. The more information stored in long-term memory in the second language, the better the ability of people to use the language. In second language learning, teachers should present the grammar and vocabulary of the second language explicitly rather than expecting learners to elicit the information themselves. Linguistic factors in second language learning, such as grammar and

vocabulary, are cognitive loads, and if students are confronted with too much unfamiliar grammar as well as vocabulary while reading, they are prone to high working memory loads.

## 3. Methodology

### 3.1 Source of Data

The study was conducted via a random sampling method with 247 students randomly selected from undergraduate students at universities across the country. The study used a questionnaire for data collection. The data collected in this study were removed by attention detection questions and the time taken to complete the questionnaire; 40 invalid samples were removed, and 207 valid samples were ultimately collected. The questionnaire consisted of 16 questions, including 4 questions on demographic variables, 11 questions on the English-Reading Anxiety Scale, and 1 question on the attention test. The scale part was scored on a five-point Likert scale, asking the subjects to choose from "strongly agree", "agree", "neither agree", "agree", "neither agree nor disagree", "disagree" or "strongly disagree". These options are scored as 1, 2, 3, 4 and 5, respectively. Theoretically, a student's total English reading anxiety score can vary from 11 to 55 points.

### 3.2 Variable Settings

The purpose of this study was to investigate the causes and outcomes of English reading anxiety among Chinese undergraduate students, including English majors. The dependent variable selected for this study was the English reading anxiety total score (out of 55) to indicate the level of English reading anxiety among Chinese undergraduate college students. The nine independent variables used in this study from the survey were 1) gender, 2) major in English, 3) grade level, 4) English proficiency, 5) grammar anxiety, 6) word comprehension anxiety, and 7) word pronunciation anxiety. Three of the variables, 5, 6 and 7, were derived from questions 6, 7 and 8 in the scale.

### 3.3 Research methods

This study used literature analysis, multiple linear regression modelling and Pearson correlation analysis. In addition, SPSS 30.0 and AMOS 29.0 statistical software were used to process the collected data.

### 3.4 Research hypotheses

H1. Gender differences have a significant effect on students' level of reading anxiety in English.

H2. The type of major has a significant effect on students' level of reading anxiety in English.

H3. There is a significant effect of grade level on students' English reading anxiety level.

H4. Differences in the current level of English proficiency significantly affect students' English reading anxiety levels.

H5. The correlation between grammar anxiety and total English reading anxiety is the most relevant among the three sources of English reading anxiety, including word comprehension anxiety, grammar anxiety and word pronunciation anxiety.

### 3.5 Reliability and validity

The English Reading Anxiety Scale used in this study was adapted by Hsiao in 2002 and is based on the Foreign Language Reading Anxiety Scale (FLRAS) designed by Saito et al. in 1999, which is a one-dimensional scale with a five-point Likert scale. Although the original scale has been used on a large scale and has good internal reliability and internal consistency ($\alpha = 0.86$), the scale was originally designed by Saito et al. to explore reading anxiety in French, Japanese, and Russian. Owing to translation, the original FLRAS would need to be rerun for reliability and validity if it were to be used to test Chinese college students' reading anxiety in English. Hsiao's altered scale was designed for non-English-speaking undergraduates in Taiwan region, and if it is to be used in this study to test English majors and non-English-speaking undergraduates in inland areas, the reliability and validity would need to be recalculated.

### 3.5.1 Reliability

After reliability analysis, the Cronbach's alpha was 0.928, indicating that the measurement tools in this study have very high internal consistency and are suitable for subsequent analyses, which is higher than the original scale.

### 3.5.2 Validity

After conducting confirmatory factor analysis (CFA) for the single-factor model, the results of the goodness-of-fit analysis and convergent validity analysis are shown in Table 1 and Table 2.

*Table 1. Results of the goodness-of-fit analysis*

|  | $x^2$/df | TLI | CFI | SRMR | RMSEA |
|---|---|---|---|---|---|
| Single-Factor Model | 2.685 | 0.93 | 0.944 | 0.058 | 0.090 |

$x^2$/df = 2.685, which is less than 3, indicating a good model fit. The Tucker–Lewis index (TLI) = 0.93, which is close to 1, indicating a better model. The comparative fit index (CFI) = 0.944, which is greater than 0.90 and meets the criteria for a good fit. The standardized root mean square residual (SRMR) = 0.058, which is less than 0.08, indicating a low error. The root mean square error of approximation (RMSEA) = 0.090, which is slightly above 0.08 but still within the acceptable range.

*Table 2. Results of the convergent validity analysis*

| Trails | | | standardized factor loadings | SE | P | CR | AVE |
|---|---|---|---|---|---|---|---|
| 1. I get upset when I'm not sure whether I understand what I am reading in English. | <--- | English Reading Anxiety | 0.709 | | | | |
| 2. When reading English, I often understand the words but still cannot quite understand what the author is saying. | <--- | English Reading Anxiety | 0.655 | 0.113 | *** | | |
| 3. When I'm reading English, I get so confused I cannot remember what I'm reading. | <--- | English Reading Anxiety | 0.764 | 0.124 | *** | | |
| 4. I feel intimidated whenever I see a whole page of English in front of me. | <--- | English Reading Anxiety | 0.824 | 0.137 | *** | | |
| 5. I am nervous when I am reading a passage in English when I am not familiar with the topic. | <--- | English Reading Anxiety | 0.777 | 0.126 | *** | | |
| 6. I get upset whenever I encounter unknown grammar when reading English. | <--- | English Reading Anxiety | 0.755 | 0.119 | *** | 0.929 | 0.543 |
| 7. When reading English, I get nervous and confused when I don't understand every word. | <--- | English Reading Anxiety | 0.823 | 0.125 | *** | | |
| 8. It bothers me to encounter words I can't pronounce while reading English. | <--- | English Reading Anxiety | 0.722 | 0.122 | *** | | |
| 9. I usually end up translating word by word when I'm reading English. | <--- | English Reading Anxiety | 0.651 | 0.13 | *** | | |
| 10. By the time your dad passed the funny letters and symbols in English, it's hard to remember what you're reading about. | <--- | English Reading Anxiety | 0.683 | 0.121 | *** | | |
| 11. I am worried about all the new symbols you have to learn in order to read English. | <--- | English Reading Anxiety | 0.718 | 0.127 | *** | | |

*Note: ***p<0.001*

*All standardized factor loadings were greater than 0.60, CR = 0.929 > 0.7, and AVE = 0.543 > 0.5, suggesting that the measurement instrument in this study has good convergent validity.*

## 4. Results

### 4.1 Descriptive analysis

The descriptive statistics are shown in Tables 3 and 4.

*Table 3. Descriptive Statistics of Demographic variables*

| | | Freq. | Percent | Valid Percent | Cum. |
|---|---|---|---|---|---|
| Gender | Female | 145 | 70 | 70 | 70 |
| | Male | 62 | 30 | 30 | 100 |
| Grade | Freshman | 38 | 18.4 | 18.4 | 18.4 |
| | Sophomore | 46 | 22.2 | 22.2 | 40.6 |
| | Junior | 42 | 20.3 | 20.3 | 60.9 |
| | Senior | 81 | 39.1 | 39.1 | 100 |
| Type of Major | Non-English-related Major | 157 | 75.8 | 75.8 | 75.8 |
| | English-related Major | 50 | 24.2 | 24.2 | 100 |
| Current Level of English Proficiency | Uncertified | 48 | 23.2 | 23.2 | 23.2 |
| | CET-4 | 83 | 40.1 | 40.1 | 63.3 |
| | CET-6 | 59 | 28.5 | 28.5 | 91.8 |
| | TEM-4 | 9 | 4.3 | 4.3 | 96.1 |
| | TEM-8 | 8 | 3.9 | 3.9 | 100 |

*Table 4. Descriptive Statistics of Total and Individual Item Scores of English Reading Anxiety*

| | N | Min | Max | Mean | SD |
|---|---|---|---|---|---|
| Total | 207 | 11 | 55 | 36.71 | 9.421 |
| 1. I get upset when I'm not sure whether I understand what I am reading in English. | 207 | 1 | 5 | 3.63 | .935 |
| 2. When reading English, I often understand the words but still cannot quite understand what the author is saying. | 207 | 1 | 5 | 3.47 | 1.032 |
| 3. When I'm reading English, I get so confused I cannot remember what I'm reading. | 207 | 1 | 5 | 3.43 | 1.138 |
| 4. I feel intimidated whenever I see a whole page of English in front of me. | 207 | 1 | 5 | 3.27 | 1.252 |
| 5. I am nervous when I am reading a passage in English when I am not familiar with the topic. | 207 | 1 | 5 | 3.44 | 1.151 |
| 6. I get upset whenever I encounter unknown grammar when reading English. | 207 | 1 | 5 | 3.47 | 1.087 |
| 7. When reading English, I get nervous and confused when I don't understand every word. | 207 | 1 | 5 | 3.34 | 1.141 |
| 8. It bothers me to encounter words I can't pronounce while reading English. | 207 | 1 | 5 | 3.09 | 1.122 |
| 9. I usually end up translating word by word when I'm reading English. | 207 | 1 | 5 | 3.29 | 1.196 |
| 10. By the time your dad passed the funny letters and symbols in English, it's hard to remember what you're reading about. | 207 | 1 | 5 | 3.03 | 1.112 |
| 11. I am worried about all the new symbols you have to learn in order to read English. | 207 | 1 | 5 | 3.24 | 1.160 |
| Effective number of cases (in columns) | 207 | | | | |

### 4.2 Correlation analysis

*Table 5. Estimated Results of the Multiple Linear Regression Model for Individual Differences*

| | B | SE | $\beta$ | $t$ | $P$ | VIF |
|---|---|---|---|---|---|---|
| (Constant) | 37.772 | 1.662 | | 22.721 | <.001 | |
| Gender | -1.637 | 1.447 | -0.080 | -1.131 | 0.259 | 1.091 |
| Type of Major | -0.510 | 1.865 | -0.023 | -0.273 | 0.785 | 1.583 |
| Freshman Above | 3.696 | 2.375 | 0.152 | 1.556 | 0.121 | 2.100 |
| Sophomore Above | -0.228 | 2.131 | -0.012 | -0.107 | 0.915 | 2.721 |
| Junior Above | 0.231 | 1.768 | 0.012 | 0.130 | 0.896 | 1.850 |
| Having a certificate of English proficiency | -2.290 | 1.986 | -0.103 | -1.153 | 0.250 | 1.745 |
| Having CET-4 Above | -3.947 | 1.594 | -0.202 | -2.476 | 0.014 | 1.467 |

| Having CET-6 Above | 1.828 | 3.702 | 0.053 | 0.494 | 0.622 | 2.567 |
|---|---|---|---|---|---|---|
| Having TEM-4 Above | -9.502 | 4.513 | -0.195 | -2.105 | 0.037 | 1.880 |
| R2 | 0.102 | | | | | |
| F | 2.490 | | | | | |
| P | 0.010 | | | | | |

The coefficient of determination R2 of the model is 0.102, which indicates that the model explains 10.2% of the variance in English reading anxiety, indicating that the model has low explanatory power. The overall regression model has a p value of 0.010 and an F value of 2.490, which indicates that the overall regression model is statistically significant because $P < 0.05$; i.e., at least one of the independent variables has a significant effect on English reading anxiety. The reported data indicate that the variance inflation factor (VIF) values of all the variables are less than 10, ranging from 1.091--2.721; thus, there is no serious multicollinearity problem in the model.

### 4.2.1 Gender Difference as a Predictive Factor

This study examined the effects of gender on the level of reading anxiety in English, and the results revealed that this factor was not significant. The data were analysed via multiple linear regression. The regression results revealed that the reading anxiety level of males was lower than that of females by an average of 1.637 points. However, the p value of the coefficient is 0.259, which is greater than 0.05, indicating that the effect of this variable on English reading anxiety is not statistically significant. Although the results of the present study indicate that males have relatively low levels of reading anxiety, these differences may be due to chance due to statistical insignificance. Therefore, gender differences do not have a significant effect on students' English reading anxiety levels.

### 4.2.2 Type of major as a predictive factor

This study examined the effects of major categories on the level of reading anxiety in English, and the results revealed that this factor was not significant. The data were analysed via multiple linear regression. The number of English majors was lower than that of non-English majors by 0.510 points. However, the p value of the coefficient is 0.785, which is greater than 0.05, indicating that the effect of this variable on English reading anxiety is not statistically significant. Although the results of the study indicate that English majors have relatively low levels of reading anxiety, these differences may be due to chance due to statistical insignificance. Therefore, English major status does not have a significant effect on students' English reading anxiety level.

### 4.2.3 Grade level as a predictive factor

The purpose of this study was to investigate whether the grade level of Chinese undergraduate students significantly affects the level of English reading anxiety. In this study, the level of English reading anxiety serves as the dependent variable, and different grades of undergraduate programs serve as the independent variables. The results of the regression analysis revealed that the average reading anxiety level of freshman above students was 3.696 points higher than that of freshman students, with a p value of 0.121, indicating that this difference was not statistically significant. The reading anxiety level of sophomores above was 0.228 points lower than that of freshmen and sophomores, with a p value of 0.915, which was also not significant. The reading anxiety level of junior above students was 0.231 points lower than that of freshmen, sophomores, and juniors, with a p value of 0.896, which also did not reach statistical significance. Therefore, the difference in grade level does not have a significant effect on students' English reading anxiety.

### 4.2.4 Different Levels of English Proficiency as Predictive Factors

This study investigated the influence of different English levels on the degree of English reading anxiety. English reading anxiety may be affected by factors such as learning experience, language proficiency and examination background. To verify the extent of the influence of the English level on reading anxiety, this study used multiple linear regression analysis to establish a mathematical model and interpret the results. The results of the regression analysis revealed that students with English certificates had an average of 2.290 points lower reading anxiety than those who had no certificate. In addition, students with a certificate above the CET-4 had an average of 3.947 points lower reading anxiety than did students who had passed the CET-4

and had no certificate, with a p value of 0.014, indicating that the effect of this variable on the level of reading anxiety reached a statistically significant level ($p < 0.05$). Students with a certificate of the CET-6 above had an average reading anxiety of 1.828 points higher than those who had not passed the CET-4 or CET-6 or had no certificate did, with a p value of 0.622, indicating that the variable had a statistically insignificant effect. Students with a certificate of TEM-4 above (i.e., TEM-8) had an average reading anxiety of 9.502 points lower than did students who had not passed CET-4, CET-6, TEM-4, or no certificate, with a p value of 0.037, indicating that the effect of this variable was statistically significant ($p < 0.05$).

*Table 6. Estimated Results of the Pearson Correlation for Vocabulary and Grammar Anxiety as English-Reading Anxiety Sources*

| | | Total | Grammar Anxiety | Word Comprehension Anxiety | Word Pronunciation Anxiety |
|---|---|---|---|---|---|
| Total | Pearson Correlation | 1 | | | |
| Grammar Anxiety | Pearson Correlation | .771** | 1 | | |
| Word Comprehension Anxiety | Pearson Correlation | .834** | .638** | 1 | |
| Word Pronunciation Anxiety | Pearson Correlation | .760** | .609** | .567** | 1 |

*Note: **p<0.01*

### 4.2.5 Vocabulary and Grammar Anxiety as English Reading Anxiety Sources

Total English reading anxiety scores were significantly and positively correlated with all the variables ($p < 0.01$), suggesting that grammar anxiety, word comprehension anxiety, and word pronunciation anxiety all increase reading anxiety levels. Word comprehension anxiety ($r = 0.834$) had the strongest correlation with English reading anxiety, indicating that vocabulary comprehension difficulties are a major source of reading anxiety. Grammar anxiety ($r = 0.771$) was the next highest, indicating that students may experience higher levels of anxiety when reading complex grammatical structures. Word pronunciation anxiety ($r = 0.760$) had a relatively small but still significant effect on reading anxiety, suggesting that students may experience increased cognitive load while reading because of unfamiliarity with word pronunciation.

## 5. Discussion

### 5.1 Individual differences as predictive factors of English-reading anxiety

In this study, multiple linear regression modelling was used to investigate the predictive factors that may contribute to Chinese undergraduates' English reading anxiety, starting from the dimensions of personal background differences and language knowledge. In terms of personal background, it was found that gender and whether one majored in English did not significantly affect Chinese undergraduates' English reading anxiety, possibly because the English teaching environment in Chinese colleges and universities is relatively uniform and that in China's higher education system, English courses are mandatory for all undergraduates, and students are required to undergo systematic English learning regardless of whether they are majoring in English. College English courses are more standardized in terms of curriculum design, teaching objectives and teaching methods, especially the popularity of the CET-4 and CET-6 exams as well as the TEM-4 and TEM-8 exams, which cause students of different majors to face similar pressures and challenges in English learning. Therefore, the effect of being an English major on reading anxiety may be weakened. The study also revealed that the difference in undergraduate grade did not have a significant effect on Chinese undergraduates' English reading anxiety levels, probably because undergraduates have more similar experiences in English learning. In the Chinese higher education system, college English courses are usually completed in the freshman and sophomore years, whereas relatively little English is studied in the junior and senior years, and many non-English majors do not receive systematic English courses after their junior year. This implies that most undergraduate students have relatively similar experiences in English learning, and there may not be any significant change in English reading anxiety levels, regardless of whether they are freshmen or seniors. In addition, the results of the study revealed that the effect of English level on reading anxiety was not equal. Students with certificates of CET-4 above (excluding CET-4) had significantly lower

levels of reading anxiety, suggesting that improved English proficiency may help alleviate reading anxiety. Passing CET-4 is a requirement for every undergraduate college student to meet. However, students with certificates of CET-6 above (excluding CET-6) did not show significantly lower levels of anxiety and even a slight increase in anxiety, possibly due to the greater difficulty of the exam above CET-6, which resulted in students feeling more pressure in reading tasks at higher levels. Similarly, the significantly lower level of reading anxiety among students with a TEM-8 certificate may be attributed to the fact that senior English majors have more solid language skills and richer reading experience than junior English majors or non-English majors do, thus reducing anxiety. In English-language teaching, varying levels of English proficiency cause students to show different degrees of anxiety in reading tasks. Therefore, in terms of class placement and textbook selection, teachers should conduct tiered teaching and personalized textbook design according to the characteristics of learners at different levels to minimize reading anxiety and improve learning efficiency. The implementation of this method involves two main nodes: students who have passed the fourth level of the university and still want to improve their English and students who have passed the fourth level of professional English but want to continue to pass the Specialized Eight. These two groups of students have relatively high English reading anxiety. Teachers need to tailor instruction as much as possible to meet the needs of these students.

## 5.2 Differences in Grammar and Vocabulary as Sources of English-Reading Anxiety

Pearson's correlation was used in this study to explore the differences between vocabulary and grammar as sources of reading anxiety in English. The results of the study revealed that vocabulary comprehension anxiety, grammar anxiety and word pronunciation anxiety were significantly and positively correlated with students' overall English anxiety. The strongest correlation was word comprehension anxiety, followed by grammar anxiety and word pronunciation anxiety. This means that word comprehension anxiety is the most significant source of anxiety for students in terms of grammar, and vocabulary is the most significant source of anxiety. Vocabulary is the foundation of reading comprehension, and students with insufficient vocabulary may feel confused and uneasy when they encounter vocabulary words in the course of reading, especially when they are unable to infer the meaning of the words from the context, and their anxiety may further increase. When confronted with vocabulary, some students may stagnate for fear of misinterpretation, which affects reading fluency and exacerbates anxiety. Students are usually exposed to common grammar rules, such as tense and passive voices, in the course of their studies, so the anxiety level of basic grammar is relatively low. However, when faced with complex sentences, such as subordinate clause nesting, inversion, and long and difficult sentences, some students may experience anxiety due to difficulties in parsing sentence structure. In addition, reading is mainly a visual input rather than an oral expression; therefore, compared with vocabulary comprehension and grammar, word pronunciation anxiety has less of an impact on reading. Teachers should focus on vocabulary improvement before they focus on grammar teaching in the process of English reading. Teachers should help students guess the meaning of words through context rather than relying on word-for-word translation. Teachers can also have students practice sentence structure analysis, such as dividing subject−verb-object and determiner clauses, to reduce the fear of complex sentences. Finally, although word pronunciation anxiety has less impact on reading, for students who are concerned about pronunciation during silent reading, speech software can be used in conjunction to help students listen to the pronunciation of words to increase confidence.

## 6. Conclusion

This study explored the factors affecting Chinese undergraduate students' English reading anxiety through multiple linear regression and Pearson correlation analysis. Gender, major category and grade level differences had no significant effect on English reading anxiety, probably due to the standardization of English teaching in Chinese universities, which exposes students from different backgrounds to similar learning pressures and challenges. The effect of English proficiency on reading anxiety was not balanced, as students who passed the CET-4 above (excluding CET-4) had reduced anxiety levels and the students with TEM-8 also had lower anxiety degree than others, which may result from exam difficulty and experience. In addition, the study compared the differences between grammar anxiety and vocabulary anxiety as sources of English reading anxiety. The results showed that word comprehension anxiety had the strongest effect on reading anxiety, followed by grammar anxiety and, finally, word pronunciation anxiety. This finding

indicates that insufficient vocabulary knowledge is the main factor contributing to reading anxiety, especially when students are unable to infer the meaning of words through context, as the level of anxiety increases significantly. Grammar anxiety, on the other hand, is reflected mainly in complex sentence parsing, such as nested clauses and inverted clauses, and is second to vocabulary anxiety in terms of its impact. In contrast, word pronunciation anxiety had a weaker effect on reading anxiety, probably because reading mainly relies on visual input rather than oral expression.

On the basis of the results of this study, students with different English proficiency levels should be taught in separate classes, and appropriate textbooks should be selected to suit certain students' needs to reduce English reading anxiety. In addition, vocabulary teaching should be prioritized in English reading instruction to help students infer the meaning of words through context and reduce the anxiety caused by vocabulary. Moreover, sentence structure analysis training can be combined with other methods to improve the comprehension of complex sentences. For students who are anxious about pronunciation, phonics software can be used to assist learning to improve reading self-confidence.

## 7. Recommendations for Further Research

There are still limitations in this study in that some aspects of individual differences, such as age and English education experience, were not explored. The coefficient of determination R2 of this multiple linear regression is relatively low, which means that other aspects of individual differences are worth researching. Future research can be based on the results of this study to introduce more variables related to individual differences to explore their predictive effects.

## References

Al-Obaydi, L. H., Rahul, D. and Pikhart, M. (2024). The effect of online oral reading on reading comprehension, reading anxiety, and classroom anxiety among EFL learners. *Education and Information Technologies,* vol. 29**,** no. 3, pp. 2841-2855.

Chen, S., Du, H., Wang, S. and Yang, L. (2022). Understanding EFL reading anxiety in relation to learning motivation, attitudes and strategies for Chinese and Spanish undergraduates. *System,* vol. 108, p. 102842.

Dewaele, J.-M. and MacIntyre, P. D. (2014). The two faces of Janus? Anxiety and enjoyment in the foreign language classroom. *Studies in second language learning and teaching,* vol. 4**,** no. 2, pp. 237-274.

Hamada, A. and Takaki, S. (2022). Psychometric assessment of individual differences in second language reading anxiety for identifying struggling students in classrooms. *Frontiers in Psychology,* vol. 13, p. 938719.

Horwitz, E. K., Horwitz, M. B. and Cope, J. (1986). Foreign language classroom anxiety. *The Modern language journal,* vol. 70**,** no. 2, pp. 125-132.

Hsiao, T.-Y. (2002). Unidimensionality of the Chinese version of the foreign language reading anxiety scale. *Perceptual and Motor Skills,* vol. 95**,** no. 3, pp. 927-933.

Karamina, W., Astrid, A. and Amrina, R. D. (2024). Factors affecting students'anxiety in reading comprehension of high school students in palembang. *Language and Education Journal,* vol. 9**,** no. 1, pp. 52-73.

Li, L., Yu, Q., Guan, Q., Li, H. and Luo, Y.-j. (2024). Attention allocation in foreign language reading anxiety during lexical processing− An ERP study with cue-target paradigm. *Brain and Cognition,* vol. 182, p. 106225.

Miao, Q. Q. and Vibulphol, J. (2021). English as a Foreign Language Reading Anxiety of Chinese University Students. *International Education Studies,* vol. 14**,** no. 3, pp. 64-71.

Saito, Y., Garza, T. J. and Horwitz, E. K. (1999). Foreign language reading anxiety. *The modern language journal,* vol. 83**,** no. 2, pp. 202-218.

Schnotz, W. and Kürschner, C. (2007). A reconsideration of cognitive load theory. *Educational psychology review,* vol. 19**,** no. 4, pp. 469-508.

Sweller, J. (2017). Cognitive load theory and teaching English as a second language to adult learners. *Contact Magazine,* vol. 43**,** no. 1, pp. 10-14.

Tran, T. T. T. (2012). A Review of Horwitz, Horwitz and Cope's Theory of Foreign Language Anxiety and the Challenges to the Theory. *English Language Teaching,* vol. 5**,** no. 1, pp. 69-75.

Ying, L. (2022). A study of college students' English reading anxiety, strategies and performance correlation. *Journal of Taiyuan City Vocational and Technical College***,** no. 2, pp. 155-157.

Zemni, B. and Alrefaee, Y. (2020). Investigating the Source of Reading Anxiety among Undergraduate Saudi Female EFL Students in Translation Departments. *TESOL International Journal,* vol. 15**,** no. 5, pp. 65-77.

Zheng, S. (2024). The effects of chatbot use on foreign language reading anxiety and reading performance among Chinese secondary school students. *Computers and Education: Artificial Intelligence,* vol. 7, p. 100271.

## Funding

## Conflicts of Interest

The authors declare no conflict of interest.

## Acknowledgment

## Copyrights