The Relationship Between Freshmen's Foreign Language Test Anxiety and Foreign Language Test Scores: Taking Colleges and Universities in Jiangsu Province as An Example

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Abstract: Foreign language test anxiety (FLTA) is a complex phenomenon. The study investigates the level of FLTA of contemporary college students and studies the relationship between the FLTA and foreign language test scores among 165 freshmen. The adapted Test Anxiety Scale (TAS) was adopted, and the foreign language test achievement took the scores of the College English Test Band 4 (CET-4) as a reference. The results showed that the average score of FLTA among freshmen was at a moderate level generally, with variations across emotional, behavioral, cognitive, and physiological aspects. FLTA levels varied by gender and major. FLTA is negatively correlated with the test scores. It provides a deep understanding of the FLTA and possibilities of enhancing foreign language test achievement, as are suggestions for future research.

1 INTRODUCTION

The impact of emotional factors on foreign language acquisition has been extensively investigated by scholars and researchers, with particular attention being paid to the phenomenon of foreign language test anxiety (FLTA) experienced during language assessment situations, which is widely recognized as a significant variable in foreign language test achievement. In the current education system of many countries, learners' academic performance is mainly evaluated on the basis of examination results, which means that academic performance is an important issue for Chinese students. In the actual English learning process, it is acknowledged that FLTA is common among college students, which compromises their performance in standardized language proficiency assessments.

There are increasing studies on the relationship between FLTA and academic performance, but there are relatively few studies among Chinese college students. Therefore, taking 165 freshmen in Chinese engineering colleges as an example, the investigation seeks to examine the potential correlation between FLTA and academic performances represented by the score of the College English Test Band 4 (CET-4) for standardized testing. Employing the quantitative method, it focuses on analyzing the current situation of FLTA of contemporary college students and the relationship between FLTA and CET-4 scores, so as to formulate proper attitudes and cognition towards FLTA on the one hand and some learning enlightenment of foreign languages on the other hand. In addition, it is crucial to enrich and expand the research content in the emerging field of FLTA, further laying the foundation for the innovation of strategies for dealing with FLTA in China.

2 LITERATURE REVIEW

2.1 Related Theories

The theoretical framework underpinning this study derives from Pekrun's (2006) Control-Value Theory of Achievement Emotions, which has gained increasing recognition in the field of second language learning and provided valuable insights into the emotional dimensions of language learning processes (Li, 2018). It covers the following core viewpoints. Firstly, the three-dimensional analysis of emotion includes valence (the distinction between positive and negative emotions), activation level (low activation and high activation), and goal orientation (process orientation and result orientation). These three

dimensions together constitute a comprehensive description of emotion and lay a theoretical foundation for the definition of emotion (Pekrun, 2006). Secondly, the domain-specific nature means that the non-target orientation of different disciplines leads to the change of learners' academic self-concept. Therefore, personalized emotional research is needed to reveal emotional dynamics for different disciplines. Finally, the complexity of the relationship network of emotions emphasizes the complex relationship among emotions, their various influencing factors and consequences. This includes the distal antecedents of emotions (e.g., individual internal and external environments), proximal antecedents (e.g., involving control evaluation and value evaluation), and their consequences (e.g., learning motivation, learning engagement, and learning strategies). This study focuses on the first two aspects, including emotion, behavior, individual cognition and physiological arousal.

2.2 Previous Studies on the Test Anxiety (TA)

The earliest study about FLTA began with American scholar Brown in 1938. Since then, there have been dozens of test anxiety measurement tools compiled and revised by western researchers. In China, Wang (2001) conducted a comprehensive evaluation of TAS through rigorous reliability and validity analyses. Besides, Ye & Rocklin (1988) and Wang (2003) examined the psychometric properties of the Chinese adaptation of TAS, confirming its measurement consistency and construct validity in the Chinese cultural context. Empirical evidence suggests that FLTA represents a common psychological response during foreign language assessment situations, affecting individuals in different age and gender groups, which is widely recognized, particularly among those whose academic performance and skill development are subject to systematic evaluation through competency-based assessment frameworks and achievement-oriented grading systems.

It is not consistent about the definition of test anxiety, owing to different perspectives and theoretical bases. For example, the earliest proposed test anxiety refers to a kind of helpless and panic emotion experienced by individuals in the exam (Mangler & Saeason, 1952). Horwitz et al. (1986) believed that FLTA was a part of the foreign language anxiety (FLA) and pointed out that the fear of tests was a unique kind of FLA . Later, FLTA is defined from disparate perspectives such as the source of test anxiety, the meaning of evaluation, the specific form

of expression, the time node, etc. (e.g., Carver et al., 1983; Zeidner, 1998). The common point is that they all assert that test anxiety is reflected in cognition, physiology, and behavior. Therefore, a Chinese scholar has proposed to define test anxiety as an emotional response based on the three components of cognition, physiology, and behavior from a more comprehensive perspective (Chen, 1989).

International scholars' research on test anxiety has matured, and the earliest research on test anxiety proposed in the 1920s provides a physiological basis for its existence. The research content of domestic scholars on test anxiety can be divided into three parts: the research on the influencing factors of FLTA, the preparation of FLTA questionnaires, and the intervention of FLTA. The investigations into the determinants of FLTA have primarily adopted a dual-dimensional approach, encompassing endogenous variables such as cognitive processes and individual chaeacteristics, as well as exogenous variables such as others' evaluative and availability of social support (Ye, 2007).

2.3 Previous Studies on the Relationship of TA and Academic Performances

The earliest study of test anxiety and academic performances is traced back to the study of the physiological and biochemical changes of subjects' anxiety experience related to test scores in the test conditions. Not until the test anxiety questionnaire was published did researchers begin to study the relationship formally between the above two. Since the 1980s, it has been mainly the aspect of psychological mechanisms and clinical research of test anxiety that has been studied. Horwitz et al. (1986) reported that there was a significantly negative relationship among college students between FLA and their final scores. At present, the research is in the stage of deepening development (Cao & Cao, 2004). More and more researchers have studied the relationship between TA and academic performances in the form of empirical research. For example, some researchers reached a conclusion that the adverse consequences of TA affect college students, substantially hindering their academic progress and impeding their potential for educational advancement (e.g., Shi & Liu, 2006). What's more, Dong's (2021) study found that there is a significant negative correlation between TA and the academic performances of English learners in China. Moreover, Li and Han (2022) assert that TA has a significant

predictive effect on English test scores. Empirical investigations have demonstrated the negative correlation between TA and academic performances across various academic stages, ranging from primary educational contexts through secondary to higher education. Therefore, considerable researches have focused on TA and academic performances. However, there are few studies on FLTA. The reason why the results are slightly biased is that standardized test scores are not commonly employed as a reference for foreign language performance.

3 RESEARCH QUESTIONS

The following questions are addressed in the present research:

1. What is the level of FLTA of contemporary college students?

2. What is the relationship between contemporary college students' FLTA and foreign language test scores?

4 METHOD

4.1 Participants

A total of 200 questionnaires were distributed, from which 165 valid responses were retained for analysis following the exclusion of invalid questionnaires that were obviously randomly answered, missed answers, and multiple choices. The effective rate was about 82.5%. On account of the particularity of the engineering college, science and engineering specialties accounted for 73.05%, and liberal arts specialties accounted for 26.96%, including 128 males (76.65%) and 39 females (23.35%).

4.2 Measurement

The TAS (Wang, 2001), a traditional test anxiety scale, was adapted by references to measure freshmen's academic performance and FLTA in the subject of the scores of CET-4 within a specific sample of Nanjing Tech Universities of Jiangsu Province. The scale consisted of 36 items utilizing a five-point Likert-type response format ranging from strongly agree, agree through neither agree nor disagree to disagree, strongly disagree. In order to increase the effectiveness of the questionnaire, reverse scoring methodology was implemented for specific negatively-phrased items (3, 24, 27, 29 & 35),

whereby lower numerical values were systematically converted to represent higher levels of the measured construct. In light of the definition of the core concept of FLTA in this study, the investigation of FLTA needed to be carried out according to the measurement of these four dimensions: test anxiety embodies emotion, behavior, individual cognition, and physiological arousal. In particular, due to the limitations of objective conditions, the only participation of the CET-4 examination result in the CET-4 examination scores was the reference for the standard examination achievement. In the context of China, the CET-4 is a compulsory examination for most college students, which underscores the importance of English proficiency in the country's educational system. Therefore, a noteworthy benefit of this strategy was its capacity to generate a significant amount of feedback from a diverse group of people. Furthermore, the previously described method offered a more accurate portrayal of FLTA during two-week period preceding the CET-4 test, aiming to investigate and analyze participants' emotional states and behavioral patterns. The consistency of measurement within the Test Anxiety Scale was assessed through Cronbach's α formula, with the result that the Crombach consistency coefficient of the scale was 0.873, and the KMO coefficient was 0.827, which meant the scale has high stability and reliability.

4.3 Procedures and Data Collection

There were two-phase data acquisition to collect the required data. In the first stage, the questionnaires used in this study were given to the freshmen at Nanjing Tech University, which was issued two weeks before the CET-4 test. Before handing out the questionnaire, it should be emphasized that the questionnaire is only used as research data and will not have any negative impact on them. Participants' profile information was required by the researcher to obtain their CET-4 scores later. The second stage involved data regarding participants' linguistic proficiency levels through an English test using the scores of the CET-4 test in the second half of 2024. It is a large-scale standardized test and a national examination with the purpose of measuring college students' English ability objectively and accurately, which is held twice in each year.

4.4 Data Analysis

All the data were input and managed by Microsoft

Excel 2019, and statistical analyses were conducted by using SPSS. There were two sets of data: the TAS scores and the freshmen's CET-4 scores in the present study. The primary statistical analysis commenced with the computation of essential descriptive parameters, where the range, mean, mode, and standard deviation were systematically derived for each dataset under investigation. To verify the distributional normality, subsequent analyses were conducted involving the calculation of both skewness and kurtosis measures. Detailed descriptive statistical analyses were also performed for each item of the TAS. Actually, a frequency distribution analysis was conducted for each item, which provided a better understanding of which features of FLTA are more apparent in participants. Pearson's correlation coefficient was used to address the research questions.

5 RESULTS

5.1 The General Situation of Freshmen's FLTA

The average anxiety value of the general foreign language test, added with the scores of the aspects of emotion, behavior, individual cognition, and physiological arousal, is manifested in the following table 1. Freshmen taken as the research objects, it is found that their FLTA is generally at a medium level. Primarily, there is no doubt that it is a realistic requirement for college students, that passing CET-4 and CET-6, to strive for better academic or career development. To a certain extent, the higher the scores of these tests, the greater the potential for further education and employment is. In order to pursue higher scores on these tests, college students are prone to feeling FLTA within the context of foreign language assessment situations. Additionally, the acquirement in Chinese universities depends on individual consciousness and self-discipline, which is different from the strict supervision of high school teachers, further improving their FLTA. As regards the four dimensions, the relatively high average scores of emotion, behavior, and individual cognition are undoubtedly a reflection of the examinees' inner worries and uneasiness in the face of exams, which is explained from the side by their attempt to alleviate their anxiety through emotional, behavioral response, and cognitive adjustment, while the relatively low score of the physiological arousal dimension may be related to the effective physical relaxation training after the current education reform.

Table 1: The general scores of the FLTA and each dimension.

Item	M±SD
Emotion	28.842±5.516
Behavior	21.867±3.780
Individual cognition	33.679±7.766
Physiological arousal	14.630±4.802
Foreign language test anxiety	96.097±18.363

5.2 Comparison of Gender Differences in the Total Score of FLTA and those of Each Dimension

The average scores of males' FLTA are significantly higher than those of females (t = -1.96, p < 0.01). Similarly, there are disparities in the scores of males and females in the four dimensions of emotion, behavior, individual cognition, and physiological arousal. On the one hand, it is traditionally recognized that females are born with more gifts for the foreign language tests than males. For a long time, females' high self-efficacy has stimulated the achievements of their foreign language tests, while males may feel more anxious owing to their lack of foreign language ability. On the other hand, some scholars assert that the negative correlation between FLTA and the use frequency of learning strategies, which, to some degree, alleviates FLTA of females. Due to the social stereotype, it is preferred that the expectation for females' foreign language test achievement, which drives females' motivation to perform well in tests and indirectly encourages them to give consideration to foreign language test strategies (Table 2).

Table 2: Difference test of the total scores of foreign language test anxiety and each dimension by gender.

	M±SD		t	p
	Male (n=126)	Female (n=39)		
Emotion	29.60±5.38	26.41±5.32	-3.241	0.001**
Behavior	21.98±3.77	21.49±3.84	-0.716	0.475**
Individual cognition	34.26±7.31	31.79±8.93	-1.744	0.083**
Physiological arousal	14.83±4.70	13.97±5.13	-0.976	0.331*
Foreign language test anxiety	97.64± 17.82	91.10± 19.43	-1.960	0.052*
* p<0.01 ** p<0.001				

5.3 Comparison of Professional Differences in Total Scores of FLTA and Those of Each Dimension

The average scores of FLTA in science and engineering specialties are significantly higher than those in liberal arts specialties (t = 2.214, p < 0.01). Similarly, there are disparities in the scores of science and engineering specialties and liberal arts specialties in the four dimensions of emotion, behavior, individual cognition, and physiological arousal. The use of foreign languages by those who major in science and engineering is lower than that of freshmen majoring in liberal arts due to the characteristics of their major, delivering a blow to fewer opportunities for them to practice foreign languages in daily life and further increasing their FLTA. On the other hand, freshmen majoring in liberal arts tend to pay attention to the comprehensiveness and practicality of foreign languages, while freshmen majoring in science and engineering apply English to academic reading and writing, ignoring the cultivation of other foreign language abilities (Table 3).

Table 3: Difference test of foreign language test anxiety scores by major.

	M±SD		t	p
	Science and engineering specialties (n=121)	Liberal arts specialties (n=44)		
Emotion	29.45±5.38	27.18±5.61	2.364	0.019*
Behavior	22.17±3.70	21.02±3.91	1.740	0.084*
Individual cognition	34.38±8.01	31.75±6.77	1.940	0.054*
Physiological arousal	15.04±4.89	13.50±4.40	1.836	0.068*
Foreign language test anxiety	97.98±18.41	90.91±17.41	2.214	0.028*
* p<0.01				

5.4 The Relationship Between Freshmen's FLTA and Foreign Language Test Scores

The Pearson correlation coefficients of these four dimensions and the total score of FLTA are manifested in the following table 4, which has passed the significance test at the significance level of 0.05. Therefore, the analysis revealed an inverse correlation between these variables, as indicated by the statistical findings. It is found that freshmen's FLTA score can be a prediction of their foreign language test achievement. In other words, the lower the score of FLTA is, the greater the foreign language test achievement is, thereby corroborating earlier research findings (e.g., Tucker et al., 1976). However, some scholars reported the facilitative anxiety in foreign language contexts (e.g., Kleinmann, 1977), which counts on the difficulty of the target task: when it is difficult, the negative effects of anxiety are unavoidable. Over the years, the average passing rate of college students in CET-4 is 40%, indicating that its difficulty, in which context excessive anxiety will bring out negative effects on foreign language test achievement.

Table 4: Correlation analysis between the scores of FLTA and each dimension and the those of CET-4.

	Scores of CET-4
Emotion	-0.203**
Behavior	-0.238**
Individual cognition	-0.211**
Physiological arousal	-0.171*
Foreign language test anxiety	-0.234**

5.5 Regression Analysis of The Total Score of Foreign Language Test Anxiety and Foreign Language Test Scores

The explanation rate of foreign language anxiety (X) to CET-4 scores (Y) was 7.2%, and the regression coefficient of "foreign language anxiety" was -0.269, which passed the significance test and was significantly different from zero (p < 0.001). It is an indication that the general FLTA has a significant negative impact on the scores of CET-4, and the influence coefficient is 0.269. Therefore, the single-variable regression equation between overall foreign language learning anxiety and CET-4 achievement can be summarized as Y = 620.307-0.269X (Table 5).

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Table 5: Regression analysis of FLTA and CET-4.

	Non-normalized coefficients		Normalized coefficients	t	p	Significance of regression equation	
	B	S.E.	Beta			F	R²
Constant	620.307	25.299	-	24.519	0.003**	F (1,158)= 12.335, p=0.001	0.072
Foreign language test anxiety	-0.924	0.263	-0.269	-3.512	0.034**		
* p<0.01 ** p<0.001							

6 DISCUSSION

The results showed that the average score of FLTA of freshmen is 96.097 and is at a moderate level generally. The scores of the aspects of emotion, behavior, individual cognition, and physiological arousal are different. Gender-based variations exist in the level of FLTA experienced by freshmen, with males demonstrating higher levels of anxiety compared to females. Disparities in FLTA are observed between freshmen majoring in science and engineering versus those in liberal arts specialties, with the former exhibiting higher than the latter. There exists an inverse relationship between FLTA and foreign language test achievement, indicating that FLTA substantially compromise participants' test scores.

Several methodological constraints should be taken into consideration to facilitate more future elaboration of this research domain. First, it needs to be admitted that the limitations in terms of demographic homogeneity across age groups, educational levels, geographical distribution as well as gender imbalance within the participant pool. Therefore, the sample lacks comprehensive generalizability across the broader spectrum of Chinese foreign language learner population, thereby restricting the potential for broader application of the study's findings across varying educational settings and demographic contexts. Second, there is little analysis about factors such as emotion, behavior, and so on that affect college students' FLTA. If not, it is

impossible that more constructive suggestions can be offered for the strategies of foreign language tests.

Despite these methodological constraints, the findings have both theoretical and pedagogical implications. Considering the FLTA, this study explains the performances and features of college students' foreign language test experiences and further explores the correlation between these four dimensions and foreign language test achievement. Hence, it highlights that the prevalence of FLTA among college students is compounded by the old strategies of the foreign language tests. For teachers and policymakers, the implementation of diversified assessment frameworks in educational settings should be prioritized as a fundamental task necessitating the systematic exploration of multiple evaluation approaches within instructional contexts. For example, teachers can incorporate supplementary assignments with incentive-based scoring systems and increase the frequency of formative assessment opportunities (Bensoussan, 2012). It is suggestive for them to replace quantitative scoring mechanisms with qualitative evaluation systems and allow college students to be involved in the assessment design process (Joy, 2013). For college students, it is requisite and indispensable to have a firm grasp of the essence and existence of FLTA. Its issue should be recognized reasonably and discussed directly, which effectively mitigate learners' anxiety by dispelling prevalent misconceptions (Phillips, 1992).

7 CONCLUSION

FLTA plays a significant role in predicting foreign language test performance, with its effects being multifaceted and influenced by various factors. The present study mainly focuses on the current situation of freshmen's FLTA and its relationship with foreign language test achievement. The adapted questionnaire and a quantitative method were used to make analyses about the level of FLTA of contemporary college students and to see whether there is relationship between FLTA and performance. The findings of this study revealed the current situation that FLTA of college students is at the middle level, and there were significant differences in gender and major. This study also shows that FLTA exerts a detrimental influence on assessment outcomes, at least under similar circumstances, which is undoubtedly a predictor of foreign language test achievement. It indicates that elevated FLTA typically

correspond with diminished academic outcomes, and vice versa. It suggests that alleviating FLTA will potentially enhance the performances of the foreign language tests to some extent. Consequently, different individuals including teachers and college students themselves should implement strategies to mitigate the anxiety in order to enhance their foreign language test achievements.

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