

# The Relationship between Chinese High School Students' Test Anxiety and Academic Performance during the National College Entrance Examination

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**Abstract.** Under China's exam-oriented educational system, high school students are under high pressure, especially before they undertake the National College Entrance Examination. In China, the National College Entrance Examination is also given the meaning of the top priority in the life of most parents. This study focuses on the influence of Chinese high school students' test anxiety on their National College Entrance Examination results. The results show that the more anxious the examinees are, the less satisfactory their scores are. On the contrary, the less anxious they are, the better their scores are. Exam anxiety is negatively related to the scores of the National College Entrance Examination. This study has important research value for the field of high school education and psychological distress in China. It fills the gap in the research on the impact of college entrance examination anxiety on the scores of senior high school students, provides a reference for the follow-up research on the mechanism of intervention in high school students' anxiety, and also makes the society and school parents pay attention to the problem of high school students' exam anxiety.

## 1 Introduction

With the continuous reform of China's education system, the influence of the National College Entrance Examination (NCEE) as an important point in students' careers has become increasingly significant. High school students are in their adolescence, which is marked by an emphasis on academics and a high prevalence of psychological distress. When high school students realize that they are in an exam situation, the feeling of anxiety can cause them to feel fear, sadness, and stress suddenly. Over time, this can have an impact on their academic performance. In the competitive educational environment in China, many high school students suffer from test anxiety. Some studies have also shown that under the COVID-19 epidemic, the proportion of Chinese senior high school students with test anxiety is 65.3%, and moderate to severe anxiety is up to 30% or more [1].

Many scholars have studied the relationship between test anxiety and achievement during the last five years. Chinese scholar Man Luo examined the connection between learning anxiety and academic achievement of the primary school student population in grades 4-6 and discovered a negative association between the two [2]. For junior and senior high school students, test anxiety had a substantial effect on their academic performance, and the road to academic achievement and the type of

discipline had a significant moderating effect on the link between the two [3]. In the research of 631 undergraduate students from the Midwest, Woldeab and Brothen discovered that increased test anxiety was associated with considerably lower marks for the college student population [4]. According to current research, many studies have shown that test anxiety affects students of various ages (from primary school to college), but the research scope of most studies is too broad and non-specific.

In addition, many studies have shown that test anxiety affects the academic performance of high school students in many different situations, such as the impact of test anxiety caused by gender differences on the academic performance of high school students [5]. However, research on the precise nature and significance of test anxiety's impacts on Chinese senior high school student's performance on the college admission exam is surprisingly few in both Chinese and other languages. It is still necessary to thoroughly examine and research the possible impacts that anxiety can have in particular test-taking situations.

In view of this issue, research on test anxiety will be valuable for China's high school education and psychological counselling sectors. This paper will start with the examination anxiety of freshmen who have just finished the 2023 NCEE in China and observe its influence mechanism on the NCEE score, so as to

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provide a useful reference for the improvement of students' psychological situation in China. This study aims to fill the gap in the research on the impact of NCEE anxiety on the scores of senior high school students. It hopes to play a certain role in the follow-up research on the mechanism of education intervention in the anxiety of senior high school students, so that the family, school and society can pay attention to the problem of senior high school students' exam anxiety and implement effective solutions.

## 2 Methodology

### 2.1 Research object and specific quantitative research method selected

Examinees who take the National College Entrance Examination in China account for a large proportion of the rectification society, which is easy to investigate. Therefore, the research participants in this study are the group of freshmen who have finished the college entrance examination in 2023. This research strictly complies with the ethical regulations for educational research. All respondents participated in this study voluntarily.

The questionnaire survey was used as the quantitative research method in this study. A questionnaire survey is a method of gathering information that involves sending a pre-designed questionnaire to respondents, who complete it, and then retrieving and processing the survey results. The authors combined the research questions and objects of this study to find the authoritative scale, then revised the scale and conducted a questionnaire survey to the sample. Finally, data analysis is carried out, and conclusions are drawn according to the results of the questionnaire survey. This study adheres to all ethical guidelines for educational research. The personal information questions in the questionnaire will be encrypted and not available to the general public, such as inviting participants to participate in the study using their name pinyin abbreviation.

### 2.2 Scale description

The Sarason Test Anxiety Scale (TAS) which targets high school and college students is the scale used in this paper. It is currently one of the test anxiety scales with the greatest international usage since developed in 1978 [6]. Through the TAS reliability test, Caikang Wang discovered that the split-half reliability was 0.7 and the alpha coefficient was 0.64, indicating strong internal consistency and dependability [7].

The authors reduced the original 37 questions of TAS to 20 questions in the questionnaire, with the additional seven questions being about personal information, allowing the study to obtain key information such as respondents' current university name and the range of their NCEE score. In this questionnaire, the research participants answered "yes" or "no" based on their current circumstances. "Yes" is worth one point; "no" is

worth zero points. Questions 23 and 14 are eligible for reverse scoring, while questions 1-7 and the last question are not included in the total score. The scoring pattern is reduced in equal parts, lowering the overall score from 37 to 19 points. A score of more than 10 indicates a high level of test anxiety; 6 to 10 indicates intermediate levels of test anxiety; a score of less than 6 indicates a low level of test anxiety; a score of 8 or higher indicates that the subject is experiencing significant discomfort as a result of taking the NCEE.

### 2.3 Sample

The survey collected a total of 265 freshmen data from different universities and colleges across the country. All participants were informed of the purpose and significance of the study and the principle of confidentiality of personal information before they filled out the questionnaire. After data checking, 65 questionnaires were screened away and 200 samples were left.

In terms of age distribution, the 200 freshmen who participated in the study were distributed in the age range of 18-19 years old, of which 100 are males and 100 are females. In addition, the 200 freshmen participating in the study come from different cities and regions, which is representative to a certain extent. The 200 freshmen participants study in different universities from the first, second, and third batches of universities. It is noteworthy that 985 and 211 project universities which were analysed in the results section are included in the first batch of universities.

### 2.4 Investigation process

The study adopts random sampling to distribute questionnaires on social media to freshmen who had taken the 2023 university entrance exam in China. The authors gathered 265 questionnaires within one day of sending them and screened 200 valid data on the second day of collection. Then, SPSS 26.0 is used in statistical analysis to analyze data, including descriptive statistics, correlation analysis, and regression analysis, to determine the link between independent and dependent variables.

## 3 Result

The survey's reliability was calculated. Cronbach's alpha value behaves well, which is greater than 0.7 (Cronbach's  $\alpha=0.722$ , Cronbach's  $\alpha$  Based on Standardized Items=0.896) indicating the analysis of the survey is reliable (see Table 1).

**Table 1.** Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.722	.896	20

As shown in Table 2, the statistics indicated that there was a strong negative correlation between the Provincial Admission Score of the National College Entrance Examination and the Anxiety Score ( $p = 0.013$ ), while the correlation between the Anxiety Score and the

Score Range of the National College Entrance Examination suggests no statistically significant. ( $p = 0.127$ )

**Table 2.** Correlations

		Anxiety Score	Score Range of the NCEE	Provincial Admission Score of the NCEE
Pearson Correlation	Anxiety Score	1.000	.081	.158
	Score Range of the NCEE	.081	1.000	-.135
	Provincial Admission Score of the NCEE	.158	-.135	1.000
Sig. (1-tailed)	Anxiety Score	.	.127	.013
	Score Range of the NCEE	.127	.	.028
	Provincial Admission Score of the NCEE	.013	.028	.
N	Anxiety Score	200	200	200
	Score Range of the NCEE	200	200	200
	Provincial Admission Score of the NCEE	200	200	200

The linear regression model presents that the relationship between Chinese high school students' test anxiety and academic performance during the NCEE is basically negative [1]. This analysis shows the same point though it has been done during the COVID-19 epidemic with different test groups.

As shown in Table 3, question 27's statistics show that participants think they basically suffered from anxiety during the preparation period of NCEE (Mean value=5.8, Median=6.8). There were 13 out of 200 participants who had given top scores, which means they thought they had been suffering from severe anxiety. Their anxiety score's mean value is 11.45, far beyond the average score of 5.78.

**Table 3.** Question 27

N	200
Mean	5.78
Std. Error of Mean	.162
Median	6.00
Mode	5
Minimum	0
Maximum	10

Table 4 presents that mild anxiety accounts for 57 people (percent=28.5%), 27 people (percent=18.5%) suffer from moderate anxiety, and severe anxiety hits a peak at 106 people (percent=53%). The result shows that more than half of the participants ( $n=123$ , percent=61.5%) suffered from uncomfortable anxiety if the anxiety score was over 8 in the period of preparing for the NCEE.

**Table 4.** The Level of Anxiety

Level of Anxiety	Frequency	Percent
Mild Anxiety (Anxiety score: below 6)	57	28.5
Moderate Anxiety (Anxiety score: 6-10)	37	18.5
Severe Anxiety (Anxiety score: above 10)	106	53.0

Through the comparison of the self-anxiety rating and anxiety score in Table 5, it shows a strong correlation (Sig. (2-tailed)  $< 0.0001$ , Pearson Correlation=.304\*\*)

**Table 5.** Correlation

		Anxiety score	Self-anxiety rating
Anxiety score	Pearson Correlation	1	.304**
	Sig. (2-tailed)		.000
	N	200	200
Self-anxiety rating	Pearson Correlation	.304**	1
	Sig. (2-tailed)	.000	
	N	200	200

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

## 4 Discussion

The main limitation of this study is that it did not account for the participants' individual differences or

other factors related to test anxiety, such as family background and peer pressure in each province, resulting in inconsistent criteria for selecting options for each individual. This paper did not take into account individual differences in test anxiety, such as self-esteem, personality, and so on. Some studies have shown that high school students' self-esteem is negatively correlated with test anxiety, and high school students' personality traits are significantly related to test anxiety [8, 9]. Regarding family, some scholars have discovered that family function can directly affect academic performance [10]. Furthermore, each province faces distinct peer pressure each year. The second flaw is that the data collected is a little too focused. According to the results, 16 percent and 10 percent of the participants were from Sichuan and Tianjin respectively, with the majority coming from 985 or 211 universities, which most likely contributed to the final statistics' bias.

To address these points, the paper proposes that scholars select senior high school students who have recently completed the NCEE as their samples and conduct more targeted surveys in future studies, such as a specific province or a few cities, in order to produce more reliable data to prove the findings of this study. In the next few years, under the reform of national policies, whether test anxiety will continue to affect the NCEE score of senior high school students and whether teachers and parents truly allow their children to reduce stress, fully understand the psychological situation of senior high school students in the face of test anxiety in this area in the follow-up study still need to make some efforts.

## 5 Conclusion

The significance of test anxiety on performance in NCEE cannot be disregarded. After conducting a comprehensive investigation and analysis of the impact of test anxiety on the academic performance of Chinese high school students in the NCEE, this study has reached the following results. The linear regression model demonstrates a negative correlation between test anxiety levels and success in the NCEE among Chinese high school students. The research revealed a strong correlation between the intensity of students' test anxiety and a notable decline in their performance on the NCEE. This demonstrates that test anxiety is not only solely a psychological condition but also exerts a tangible influence on students' academic achievement and outcomes in NCEE. Consequently, anxiety might hinder pupils from fully achieving their potential. For Chinese high school students, the college admission examination is a pivotal milestone in their lives, hence it is crucial to address how to manage anxiety effectively. It is imperative for schools and families to offer essential assistance and guidance to pupils in order to cultivate a proper mentality for learning and to build effective tactics for taking tests. By adopting this approach, students will have the opportunity to fully utilize their abilities during the college admission exams, thereby establishing a strong basis for their future endeavors.

## Authors contribution

All the authors contributed equally and their names were listed in alphabetical order.

## References

1. Y. Li, Z. Li, G. Zhang, L. Huang, X. Luo. *Med. F. T. H.* **10**, 208-210, (2020)
2. M. Luo. Study on the Relationship and Intervention Between Learning Anxiety, Attention and Academic Achievement of Students in Grades 4-6, MSc Thesis, Zhangzhou, (2022).
3. Y. Meng, H. Ma, Q. Shi, *FU. Edu. FR.*, **4**, 18-28, (2023)
4. D. Woldeab, T. Brothen. *IJEDE* **34**(1), 1-10, (2019)
5. M. M. Dubuc, M. Aubertin-Leheudre, A. D. Karelis, *Int. J. Prev. Med.* **11**, 1-7, (2020)
6. I. G. Sarason. *Stress and Anxiety* **5**, 193-216, (1978)
7. C. Liu, Y. Liu, F. Cao, Z. Yang, H. Ma. *Adv. Psychol. Res.* **12**, 3322, (2022)
8. F. Li. Mindfulness and Test Anxiety in High School Students: The Chain Mediating Role and Intervention of Self-esteem and Emotional Regulation of Self-efficacy, MSc Thesis, Nanchang, (2023)
9. N. Tang. Research on the Relationship among Personality Characteristics, Academic Efficacy and Test Anxiety of High School Students, MSc Thesis, Hanzhong, (2022)
10. S. Zhu. The Impact of Family Functioning on Academic Achievement in High School Students: The Role of Self-Acceptance, Self-Evaluation, and Learning Motivation, MSc Thesis, Nanning, (2023)