

# ***The Mediating Role Of Procrastination On The Relationship Between Academic Stress And Academic Achievement Of General High School Students In Jin Hua City, Zhe Jiang Province, China***

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**Abstract:** This study investigates the mediating effect of procrastination on the relationship between academic stress and academic achievement among high school students in Jinhua City, Zhejiang Province, China. Using a quantitative approach with a sample of 279 Grade 3 students from eight key high schools, data was collected through validated scales measuring academic stress, procrastination, and academic achievement. The findings revealed high levels of academic stress ( $M=3.76$ ) and academic achievement ( $M=3.54$ ), with moderate levels of procrastination ( $M=3.26$ ) among the students. Structural equation modeling confirmed that procrastination partially mediates the relationship between academic stress and academic achievement, with a variance accounted for (VAF) of 42.48%. All dimensions of academic stress were significant predictors of academic achievement, with academic factors having the strongest predictive power. The study provides valuable insights for educational practice, suggesting that interventions targeting both academic stress and procrastination could enhance students' academic performance.

## **1. Introduction**

Academic achievement plays a crucial role in high school education in China, serving as the primary criterion for evaluating students' capabilities and future opportunities. In China, the National College Entrance Examination (Gaokao), a highly competitive and rigorous standardized test, is widely regarded as an ultimate academic achievement goal for general high school students.

Success in the Gaokao largely determines a student's future academic and career trajectories (Liu, 2022). Due to China's large population, the competition for Gaokao is exceptionally fierce. In 2022, 11.93 million students registered for the exam, but only 4.6794 million entered undergraduate programs, indicating that only 38% of students have access to 4-year formal undergraduate education (CCTV.CO, 2023).

This competitive environment creates enormous academic stress for high school students. Academic stress, as one of the crucial factors, profoundly affects students' academic achievement. Notably, there is a close relationship between academic stress and procrastination. On one hand, properly handled, moderate stress may motivate students to work harder and positively influence student achievement. On the other hand, excessive stress may lead to academic procrastination as a coping mechanism, which could negatively impact academic performance.

While numerous studies have examined academic stress and its impact on achievement, or procrastination and its relationship with academic outcomes, few studies have specifically investigated the mediating role of procrastination in the relationship between academic stress and academic achievement among high school students in China. This study aims to fill this gap by exploring this mediating relationship in the context of Jinhua City, Zhejiang Province, China.

## 1.1 Research Objectives

The specific objectives of this study are:

To identify current levels of academic stress, procrastination, and academic achievement among general high school students in Jinhua City.

1. To determine the relationship between academic stress and academic achievement.
2. To determine the relationship between procrastination and academic achievement.
3. To determine the relationship between academic stress and procrastination.
4. To determine which dimensions of academic stress predict academic achievement.
5. To test the mediating role of procrastination on the relationship between academic stress and academic achievement.

## 1.2 Research Questions and Hypotheses

This study addresses the following research questions and corresponding hypotheses:

RQ1: What are the current levels of academic stress, procrastination, and academic achievement among general high school students in Jinhua City?

RQ2: Is there any significant relationship between academic stress and academic achievement?

H1: There is a significant negative relationship between academic stress and academic achievement.

RQ3: Is there any significant relationship between procrastination and academic achievement?

H2: There is a significant negative relationship between procrastination and academic achievement.

RQ4: Is there any significant relationship between academic stress and procrastination? H3: There is a significant positive relationship between academic stress and procrastination.

RQ5: Which dimensions of academic stress predict academic achievement? H4a: Relating to Others predicts academic achievement. H4b: Personal Factors predict academic achievement. H4c: Environmental Factors predict academic achievement. H4d: Academic Factors predict academic achievement.

RQ6: To what extent does procrastination play a mediating role between academic stress and academic achievement? H5: Procrastination fully mediates the relationship between academic stress and academic achievement.

## 2. Literature Review

### 2.1 Academic Stress and Academic Achievement

Academic stress refers to the psychological burden that students bear in their learning activities (Qian & Fuqiang, 2018). Research has consistently shown that academic stress can significantly impact students' academic performance. Liu & Lu (2011) found that higher levels of academic stress were associated with poorer academic performance among Chinese high school students. Pascoe et al. (2020) concluded in their comprehensive review that excessive stress can impair cognitive functioning, memory, attention, and overall academic performance.

The relationship between academic stress and academic achievement is particularly salient in the context of high-stakes examinations like the Gaokao. Sun et al. (2013) found that senior high school students in East Asian educational systems experience significant academic stress, particularly those preparing for college entrance examinations. This stress can undermine academic performance through various mechanisms, including impaired cognitive functioning, anxiety, and maladaptive coping behaviors.

### 2.2 Procrastination and Academic Achievement

Academic procrastination refers to the tendency to delay or postpone academic tasks (Solomon & Rothblum, 1984). Kim & Seo (2015) conducted a meta-analysis of 33 studies on academic procrastination and found a significant negative correlation between procrastination and academic performance. Their analysis revealed that procrastination was associated with lower grades, poorer examination performance, and reduced overall academic achievement.

Steel (2007) found in his comprehensive meta-analysis that procrastination was negatively correlated with academic achievement across all educational levels. His analysis of 216 studies revealed that procrastination consistently predicted lower GPA, course grades, and overall academic performance, even after controlling for other factors such as ability and motivation.

### 2.3 Academic Stress and Procrastination

The relationship between academic stress and procrastination has been explored in various studies. Sirois & Pychyl (2013) proposed that procrastination often functions as a short-term mood regulation strategy in response to stress. Their review suggested that individuals may delay tasks that are perceived as stressful or aversive to temporarily avoid negative emotions.

Tice & Baumeister (1997) found that students who experienced higher levels of academic stress were more likely to procrastinate on academic tasks. Their longitudinal study revealed that stress predicted increased procrastination over the course of a semester, particularly for students who were more susceptible to stress.

### 2.4 Procrastination as a Mediator

Few studies have specifically examined procrastination as a mediator between academic stress and academic achievement, particularly in the Chinese high school context. However, studies in related areas suggest the potential for such a mediating relationship. Sirois (2014) found that procrastination partially mediated the relationship between stress and various negative outcomes, including reduced performance and well-being. Stead et al. (2010) found that procrastination acted as a mediator between perceived stress and academic performance among college students.

### 3. Methodology

#### 3.1 Research Design

This study employed a quantitative research approach using a survey method to collect data from general high school students in Jinhua City, Zhejiang Province, China. The research framework included academic stress as the independent variable, procrastination as the mediating variable, and academic achievement as the dependent variable.

#### 3.2 Population and Sampling

The population comprised Grade 3 high school students from eight key high schools in Jinhua City who were preparing for the 2024 Gaokao. A stratified random sampling method was used to select participants. A total of 300 questionnaires were distributed, with 287 returned (95.7% response rate), of which 279 were valid (93.0% validity rate).

#### 3.3 Research Instruments

Three validated instruments were used in this study:

1. Academic Stress Scale (ASS): Developed by Yumba (2010), this 33-item scale measures academic stress across four dimensions: interpersonal stress, personal stress, academic stress, and environmental stress. Respondents rated items on a 5-point Likert scale (1=No Stress to 5=Extreme Stress).
2. Procrastination Assessment Scale-Students (PASS): Developed by Solomon & Rothblum (1984), this 18-item scale assesses procrastination across six academic domains: writing tasks, exam preparation, reading assignments, administrative tasks, attendance activities, and general academic activities. Respondents rated items on a 5-point Likert scale (1=Never Procrastinate to 5=Always Procrastinate).
3. Academic Achievement Scale (AAS): Developed by Luo Qin (2023), this 19-item scale measures academic achievement across four dimensions: academic dedication, learning performance, interpersonal promotion, and objective achievement. Respondents rated items on a 5-point Likert scale (1=Strongly Disagree to 5=Strongly Agree).

All instruments demonstrated excellent reliability, with Cronbach's alpha values of 0.894 for ASS, 0.883 for PASS, and 0.889 for AAS.

#### 3.4 Data Collection and Analysis

Data collection was conducted between February and March 2025. The data was analyzed using SPSS 26.0 for descriptive statistics, correlation analysis, and multiple regression analysis, while Smart PLS was used for structural equation modeling to test the mediating effect of procrastination.

### 4. Results

#### 4.1 Demographic Profile

The sample comprised 279 valid respondents, with a relatively balanced gender distribution (48.4% male, 51.6% female). The majority of respondents (93.5%) were 18 years old or older, and all were Grade 3 students preparing for the 2024 Gaokao.

#### 4.2 Current Levels of Academic Stress, Procrastination, and Academic Achievement

The results indicate high levels of academic stress ( $M=3.76$ ,  $SD=0.64$ ) and academic achievement ( $M=3.54$ ,  $SD=0.58$ ), with moderate levels of academic procrastination ( $M=3.26$ ,  $SD=0.70$ ) among the respondents. Within academic stress, the academic stress dimension scored the highest ( $M=4.15$ ,  $SD=0.59$ ), reflecting the significant stress students experience from academic demands, particularly examinations.

For procrastination, keeping up with weekly reading assignments ( $M=3.58$ ,  $SD=0.85$ ) and doing homework ( $M=3.45$ ,  $SD=0.82$ ) received the highest ratings, indicating that students are more likely to procrastinate on these tasks compared to exam preparation ( $M=2.98$ ,  $SD=0.92$ ), which received the lowest rating.

*Table 1: Descriptive Statistics for Study Variables (N=279)*

Variable	Mean	Standard Deviation	Level
Academic Stress	3.76	0.64	High
- Academic Stress Dimension	4.15	0.59	High
- Personal Stress	3.87	0.72	High
- Social Stress	3.62	0.78	High
- Environmental Stress	3.42	0.83	High
Academic Procrastination	3.26	0.70	Moderate
- Weekly Reading Assignments	3.58	0.85	High
- Doing Homework	3.45	0.82	High
- Administrative Tasks	3.32	0.88	Moderate
- Academic Activities in General	3.10	0.78	Moderate
- Attendance Tasks	3.02	0.90	Moderate
- Studying for Exams	2.98	0.92	Moderate
Academic Achievement	3.54	0.58	High
- Academic Dedication	3.70	0.65	High
- Learning Performance	3.62	0.72	High
- Objective Achievement	3.46	0.78	High
- Interpersonal Promotion	3.42	0.70	High

### 4.3 Relationship between Academic Stress and Academic Achievement

The correlation analysis revealed a significant negative relationship between academic stress and academic achievement ( $r=-0.387$ ,  $p<0.01$ ). This moderate negative correlation indicates that as academic stress increases, academic achievement tends to decrease among the respondents.

The structural equation modeling results confirmed this relationship ( $\beta=-0.412$ ,  $t=8.365$ ,  $p<0.001$ ), with academic stress explaining 17.0% of the variance in academic achievement.

*Table 2: Correlation between Academic Stress and Academic Achievement*

Variables	1	2
1. Academic Stress	1.000	
2. Academic Achievement	-0.387**	1.000

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

### 4.4 Relationship between Procrastination and Academic Achievement

*Table 3: Correlation between Academic Procrastination and Academic Achievement*

Variables	1	2
1. Academic Procrastination	1.000	
2. Academic Achievement	-0.451**	1.000

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

The correlation analysis revealed a significant negative relationship between academic procrastination and academic achievement ( $r=-0.451$ ,  $p<0.01$ ). The structural equation modeling results confirmed this relationship ( $\beta=-0.475$ ,  $t=9.682$ ,  $p<0.001$ ), with procrastination explaining 22.6% of the variance in academic achievement.

### 4.5 Relationship between Academic Stress and Procrastination

*Table 4: Correlation between Academic Stress and Academic Procrastination*

Variables	1	2
1. Academic Stress	1.000	
2. Academic Procrastination	0.432**	1.000

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

The correlation analysis revealed a significant positive relationship between academic stress and academic procrastination ( $r=0.432$ ,  $p<0.01$ ). The structural equation modeling results confirmed this relationship ( $\beta=0.458$ ,  $t=8.925$ ,  $p<0.001$ ), with academic stress explaining 21.0% of the variance in academic procrastination.

#### 4.6 Dimensions of Academic Stress as Predictors of Academic Achievement

*Table 5: Multiple Regression Analysis of Academic Stress Dimensions Predicting Academic Achievement*

Predictor Variables	Unstandardized Coefficients		Standardized Coefficients	t	p
	B	Std. Error	Beta		
(Constant)	5.482	0.235		23.328	0.000
Social Stress	-0.185	0.048	-0.212	-3.854	0.000
Personal Stress	-0.162	0.052	-0.195	-3.115	0.002
Academic Stress	-0.268	0.051	-0.312	-5.255	0.000
Environmental Stress	-0.108	0.045	-0.132	-2.400	0.017

Note: Dependent Variable: Academic Achievement;  $R=0.512$ ,  $R^2=0.262$ , Adjusted  $R^2=0.251$ ,  $F(4, 274)=24.382$ ,  $p<0.001$

The multiple regression model was statistically significant,  $F(4, 274)=24.382$ ,  $p<0.001$ , and explained 26.2% of the variance in academic achievement. All four dimensions of academic stress were significant predictors of academic achievement, with academic stress being the strongest predictor ( $\beta=-0.312$ ,  $p<0.001$ ), followed by social stress ( $\beta=-0.212$ ,  $p<0.001$ ), personal stress ( $\beta=-0.195$ ,  $p=0.002$ ), and environmental stress ( $\beta=-0.132$ ,  $p=0.017$ ).

#### 4.7 Mediating Effect of Procrastination

*Table 6: Mediation Analysis Results*

Path	Direct Effect	Indirect Effect	Total Effect	VAF
Academic Stress → Academic Procrastination	0.458**	-	0.458**	-
Academic Procrastination → Academic Achievement	-0.382**	-	-0.382**	-
Academic Stress → Academic Achievement	-0.237**	-0.175**	-0.412**	42.48%

Note: \*\* Effect is significant at the 0.01 level; VAF = Variance Accounted For (indirect effect / total effect)

The mediation analysis revealed that procrastination partially mediates the relationship between academic stress and academic achievement, with a Variance Accounted For (VAF) of 42.48%. This indicates that a significant portion (42.48%) of the effect of academic stress on academic achievement is transmitted through the procrastination pathway. However, there remains a significant direct effect of academic stress on academic achievement that is not explained by procrastination.



## 5. Discussion

### 5.1 Current Levels of Academic Stress, Procrastination, and Academic Achievement

The high levels of academic stress observed in this study align with previous research on students in high-pressure academic environments. Sun et al. (2013) found that senior high school students in East Asian educational systems experience significant academic stress, particularly those preparing for high-stakes college entrance examinations. The finding that academic stress was the highest-rated dimension of academic stress ( $M=4.15$ ) is consistent with research by Putwain (2007), who identified examination pressure as a primary source of stress among high school students.

The moderate level of academic procrastination ( $M=3.26$ ) provides interesting insights into how students manage their academic responsibilities in the face of high stress levels. The finding that students procrastinate more on reading assignments and homework compared to exam preparation is consistent with research by Steel (2007) and Ferrari et al. (2005), who found that students prioritize exam preparation over other academic tasks due to the high-stakes nature of examinations in competitive educational systems.

The high level of academic achievement ( $M=3.54$ ) reported by students despite experiencing high stress and moderate procrastination suggests resilience in the face of academic challenges. This resilience may be attributable to various factors, including the strong emphasis on academic excellence in high-achievement cultures, effective coping strategies, and the motivational role that a certain level of stress can play in academic performance.

### 5.2 Relationships between Variables and Mediating Effect

The negative relationship between academic stress and academic achievement ( $r=-0.387$ ) found in this study is consistent with existing literature. Pascoe et al. (2020) found that excessive stress can impair cognitive functioning, memory, attention, and overall academic performance. The negative relationship between procrastination and academic achievement ( $r=-0.451$ ) aligns with Kim & Seo's (2015) meta-analysis, which found that procrastination was associated with lower grades and poorer academic performance.

The positive relationship between academic stress and procrastination ( $r=0.432$ ) supports the findings of Sirois & Pychyl (2013), who proposed that procrastination often functions as a short-term mood regulation strategy in response to stress. Students may delay tasks that are perceived as stressful or aversive to temporarily avoid negative emotions, even though this delay often leads to increased stress in the long run.

The finding that procrastination partially mediates the relationship between academic stress and academic achievement ( $VAf=42.48\%$ ) is particularly significant. This partial mediation indicates that academic stress affects academic achievement both directly and indirectly through increased procrastination behavior. This finding is consistent with research by Sirois (2014), who found that procrastination partially mediated the relationship between stress and various negative outcomes, including reduced performance and well-being.

## 6. Conclusion

This study investigated the mediating role of procrastination on the relationship between academic stress and academic achievement among general high school students in Jinhua City, Zhejiang Province, China. The findings revealed high levels of academic stress and academic achievement, with moderate levels of procrastination among the students. Academic stress was negatively related to academic achievement, while positively related to procrastination.



Procrastination, in turn, was negatively related to academic achievement. All dimensions of academic stress (social, personal, academic, and environmental) were significant predictors of academic achievement, with academic stress being the strongest predictor. Procrastination was found to partially mediate the relationship between academic stress and academic achievement, accounting for 42.48% of the total effect.

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