

Effects of Chinese Language Learning Anxiety on the Mental Health of International Students in China: The Chain Mediating Effect of Campus Adaptation and Academic Resilience

Jinxin Qian¹, Jiayuan Yu²

¹Department of International Cultural Education, Nanjing Normal University, Nanjing, People's Republic of China; ²Department of Psychology, Nanjing Normal University, Nanjing, People's Republic of China

Correspondence: Jinxin Qian, Email jinxin00791@163.com

Introduction: Studies have shown that Chinese language learning anxiety among international students in China can negatively affect their psychological adjustment. However, the specific effects and conditions of learning anxiety need to be further investigated. This study explored the mediating effects between Chinese language learning anxiety and psychological adjustment of international students in China.

Methods: Chinese Learning Anxiety Scale, Campus Adaptability Scale for International Students in China, Academic Resilience Questionnaire for International Students in China, Zung's Self-Rated Depression Scale were administered to 307 international students from Nanjing Normal University in China, including 165 male students and 131 female students, aged 19–28 ($M = 21.42$; $SD = 1.528$).

Results: Chinese language learning anxiety significantly predicted the psychological well-being of international students after controlling for gender and age variables. Furthermore, Chinese language learning anxiety predicted the mental health of students through the independent mediating effect of campus adaptation and academic resilience, as well as the chain mediating effect of campus adaptation and academic resilience.

Conclusion: The study has theoretical and practical significance for improving international students' psychological adaptation and health, and implications for those involved in the management and teaching of international students in China. The research conclusions are as follows: firstly, when the Chinese learning anxiety of international students in China is strong, their campus adaptation and psychological resilience are reduced, and levels of depression increase; secondly, grades are significantly correlated with anxiety dimensions, and higher grades are associated with lower anxiety levels; finally, the mediating effects of campus adaptation and academic resilience were significant, together with a significant chain mediating effect of campus adaptation and academic resilience.

Keywords: international students in China, Chinese language learning anxiety, campus adaptation, academic resilience, psychological health

Introduction

Cross-cultural adaptation is a psychological coping mechanism that international students use to adapt to life in a new country and cope with the cultural shock of an unfamiliar environment and language. The coping mechanism is critical for the psychological health of international students when they experience a foreign culture. Studies have shown that international students' language problems may lead to negative attitudes towards learning, and campus adaptation problems, such as differences in teaching style, may decrease interest in learning, creating psychological problems.^{1,2} The mental health of international students in China is important for their personal development and social harmony. To address the mental health challenges of international students in China, we need to investigate the factors influencing them and mechanisms of action. The purpose of this study was to provide targeted suggestions for those involved in the

management and teaching of international students in China to improve the cross-cultural adaptation of the international student population in this setting.

Many international students experience psychological problems, such as stress, depression, homesickness, and loneliness.³ Academic stress and anxiety can be defined as a relationship between the student and the demands of the academic environment that is perceived by the student as threatening and endangers their well-being.⁴ International students in China have a heavy study load and full schedules, and spend most of their time studying. If the learning outcomes or process are not in line with their expectations, anxiety can arise.⁵ The relationship between second language learning anxiety and age, gender, nationality, educational background, and years of study also requires further study. If Chinese language learning anxiety is not addressed, it may lead to psychological difficulties, such as depression, which may, in turn, result in externally manifested behavioral problems, such as self-harming or harming others to counteract depression. International students need support to manage their language learning anxiety constructively, to reduce or eliminate depressive conditions, and ultimately adapt effectively to living and studying in China.

The mental health of international students in China is often operationalized as a measure of depression, and depression is considered the most common problem for which international students seek counseling. Students frequently report depression, feelings of worthlessness, and loneliness to counseling services.⁶ Scholars have explored the psychological adjustment of international students in China – and the factors influencing it – to effectively address the psychological challenges faced by these students.^{7,8} The mean scores of the Self-reporting Inventory (SCL90) were higher for international students than Chinese college students, and evaluations related to other physical and psychological difficulties also indicated overall poor adjustment of international students in China. Chang concluded that international students in China may experience psychological symptoms, including anxiety, confusion and disorientation, discomfort and dissatisfaction, and helplessness and depression. Academic study, life and environmental pressure, and cultural differences likely contribute to these difficulties.⁹

The impact of language learning stress on the psychological adjustment of international students has also been addressed by international scholars.^{1,2} However, most studies have focused only on the direct relationship between language learning stress and psychological symptoms. Therefore, the present study explored the mediating pathway underpinning the influence of academic anxiety on psychological health, to fill the gap in existing studies and provide a reference for improving the psychological health of international students in China.

Some scholars have classified campus adaptation as a sub-type of cross-cultural adaptation.^{6,10,11} Others considered campus adaptation as an independent factor and studied it alongside psychological and sociocultural adaptation.^{12,13} In the present study, we treated campus adjustment as an independent variable. Regarding the influence of second language learning anxiety on campus adaptation, researchers note that international students face a range of problems adapting to campus life when learning a new language in a foreign country. Such challenges may include unfamiliar food and living environment, new educational system, and language barriers, including second language anxiety.^{14,15} These problems may impact adjustment to the campus, leading to academic failure or abandonment of language learning and, ultimately, psychological problems. Where international students have adjusted well to their courses, they have lower dropout rates and more optimal classroom performance.¹⁶ International students spend most of their time on campus because they have come to China mainly to learn Chinese in colleges and universities. Thus, all aspects of the campus affect their psychological status, and better adaptation to the campus typically equates to better psychological health. Studying abroad affords opportunities for self-improvement. However, it also brings about problems associated with cross-cultural education, such as academic adaptation, cross-cultural stress, lack of social support, and low cultural identification with the host country, often contributing to psychological maladjustment.^{2,15,17}

Academic resilience is defined as “the ability to overcome significant threats or adversities in a student’s educational development”.¹⁸ It is a subfield developed from psychological resilience, a field of study that emerged in Western psychology in the 1970s and 1980s as an important topic in positive psychology. Masten defined mental toughness as “the process, ability, or outcome of successful adaptation in challenging or threatening situations”.¹⁹ Bandura suggested that judgment of risk and adversity, and assessment of ability and outcome, are directly related to specific events that occur in a given environment.²⁰ Martin and Marsh noted that while many students underperform, a significant number also manage to change their academic misfortunes and thrive in the face of adversity.²¹ However, the fact that some

children are able to overcome the difficulties of poverty and succeed, while others do not, illustrates individual resilience. Thus, academic resilience can be viewed as a context-specific form of individual psychological resilience, with the main focus on psychological resilience in educational contexts. Academic resilience is the ability of an individual to recover from low academic performance²² or the ability to cope effectively with setbacks and maintain good academic performance.^{23–25}

Wu compared international students in China with Chinese university students and found that international students had more psychological difficulties, suggesting they are less resilient in coping with academic stress and change.²⁶

The cognitive theoretical model of stress suggests that stress generation depends on an individual's assessment of a situation and their own resources, and that losing control, stress, and anxiety are symptoms of reduced coping ability and lower levels of resilience.²⁷ The stress process of mental resilience has three stages: vigilance, resistance, and exhaustion, and prolonged or high-intensity stimuli tend to cause individuals to enter the exhaustion stage. Thus, those who experience chronic stress may show effects of dysfunction, resulting in impaired mental toughness,²⁸ that may affect physical and mental health.²⁹ Resilience is related to academic performance – serving as a protective factor against negative emotions, reduced motivation and lowered internal well-being.³⁰

Purpose and Research Hypotheses

Current research on the effects of anxiety and campus adjustment on mental health has resulted in many explanations for the mechanisms of their effects. Previous studies also indicated that academic resilience may be an influencing factor. In addition, there are few studies on the mental health of international students in China. Thus, this paper aimed to construct a mediation model to explore the relationship between Chinese learning anxiety, cross-campus adaptation, academic resilience, and psychological depression among international students in China. The hypotheses were as follows.

H1: Campus adaptation plays a mediating role between Chinese language learning anxiety and mental health.

H2: Academic resilience mediates the relationship between Chinese language learning anxiety and mental health.

H3: Campus adaptation and academic resilience mediate the relationship between Chinese language learning anxiety and mental health.

Materials and Methods

Participants

We surveyed 307 international students from Nanjing Normal University. A total of 307 questionnaires were distributed and 296 valid questionnaires were returned. The effective response rate was 96%, including 165 male and 131 female students, aged 19–28, with an average age of 21.42 years and a standard deviation of 1.528. Participants represented a total of 72 nationalities, and international students were divided into five major regions by nationality: 28.7% from Southeast Asia, 41% from Central Asia, 3.4% from Europe and America, 24.4% from Africa, and 2.8% from South America.

Measures

Chinese Learning Anxiety Scale

To investigate the anxiety levels of international students in China, the Foreign Language Classroom Anxiety Scale (FLCAS) developed by Horwitz was used,⁵ with 33 items divided into four dimensions: classroom expression anxiety, oral expression anxiety, test anxiety, and negative assessment anxiety. The questionnaire uses a Likert 5-point scale, with 1 representing “strongly disagree” and 5 representing “strongly agree”. This questionnaire is commonly used to measure the anxiety of second language learning students, and has been used by many groups of international students in China.³¹ The term “foreign language class” was changed to “Chinese language class” in the questionnaire. The sum of the scores of all items was the total score of Chinese learning anxiety, and to test the mediating effect, reverse scoring was used. Higher scores indicated lower levels of anxiety. After validated factor analysis to test the measurement model, the four-

factor model in this study fitted the data well with $\chi^2/\text{df}=1.71$, RMSEA = 0.064, CFI = 0.921, TLI = 0.909, and SRMR = 0.052. The 90% confidence interval of RMSEA was [0.050, 0.077]. The internal consistency coefficient of the total scale was 0.907, indicating that this scale has good reliability and structural validity among pre-college students in China.

Campus Adaptability Scale for International Students in China

The Campus Adaptation Scale for International Students in China is based on the questionnaire compiled by Zhu Guohui and Wang Dongyan.^{32,33} The scale was adapted for the purposes of our study and items were added or deleted to fit with the actual situation of the participants. Finally, 16 items were included that measured adaptation to the curriculum (eg, “I am satisfied with the Chinese curriculum”), adaptation to extracurricular life (eg, “I think the problem of eating affects my study and I need to spend a lot of time cooking”), and adaptation to study (eg, “I can finish my homework on time”). The questionnaire measured the campus adaptation of international students in China in three aspects. The sum of the scores of all items on a 5-point Likert scale (where 1=totally disagree and 5=totally agree) was the total score of school adjustment of international students in China. Higher total scores indicated better school adjustment. After the measurement model test, 4 items with low factor loadings were deleted, and finally, 12 items were obtained with good measurement model fit, $\chi^2/\text{df}=1.5$, RMSEA= 0.054, CFI= 0.963, TLI= 0.952, and SRMR= 0.050. The 90% confidence interval of RMSEA was [0.026, 0.077]. In this study, the internal consistency coefficient of the scale was 0.855.

Academic Resilience Questionnaire for International Students in China

This study referred to the Academic Buoyancy Scale (ABS) of Martin and Marsh. The scale has four items, including negative academic feedback, homework stress, academic stress, and poor grades. We also referred to the Academic Resilience Scale (ARS-30) developed by Cassidy,³⁰ which contains 30 items that probe how individuals would react in specific situations, such as being criticized by teachers when they fail. The scale has three dimensions: persistence (eg, “I will not give up trying”), seeking help and reflection (eg, “I will ask my teacher for help”), and negative emotions (eg, “I may be very disappointed”). In this study, items such as “I will seek help from my family”, were adapted according to the situation of international students in the matriculation program. In interviews with international students prior to test administration, almost all reported that they would not seek help from their families. This may be related to the special study environment of international students in the program – they are far away from their families, and their families would not be able to help with their studies. Thus, such items were deleted, and three additional items were added. The sum of the scores of all items on a 5-point Likert scale (where 1=totally disagree and 5=totally agree) was the total score of academic resilience of international students in China. Higher total scores indicated better academic resilience. The final scale consisted of 30 items in three dimensions, namely perseverance, help-seeking and support, and negative emotion. The reliability of the scale was tested by validated factor analysis. The measurement model fit indices were as follows: $\chi^2/\text{df}= 2.2$, RMSEA= 0.074, CFI= 0.9, TLI= 0.88, and SRMR= 0.054. The 90% confidence interval of RMSEA was [0.063, 0.086], indicating that the model fit was good and in accordance with the theoretical conception. The internal consistency coefficient of the scale was 0.812 in this study.

Zung's Self-Rated Depression Scale

Measurement of mental health status relied mainly on Zung's Self-Rated Depression Scale (SDS), which contains 20 items and is often used in cross-cultural psychological adjustment studies.^{32,34} The scale uses a 5-point Likert scale where 1=never and 5=always, and the sum of all item scores was the total score of international students' psychological adjustment. Higher total scores indicated better cross-cultural psychological adjustment. The model fitted well with $\chi^2/\text{df}=2$, RMSEA=0.076, CFI= 0.826, TLI =0.784, SRMR=0.074, and the 90% confidence interval of RMSEA was [0.058, 0.094]. The internal consistency coefficient of the scale was 0.81 in the study.

Procedure

Group administration was used, with the class as the unit in this study. In the classroom, class teachers interpreted the instructions, explained the significance of the survey, emphasized that the survey had nothing to do with grades and was anonymous, and asked students to answer independently based on their actual situations. To improve the reliability of responses, the Chinese questionnaire was translated into English, Russian, Turkmenistan, and Lao, and students

completed the most appropriate version of the questionnaire in class. The class teacher was asked to briefly check whether student responses reflected the actual situation, such as “I can stay in the class” and “I can finish my homework on time”, to eliminate invalid responses. To obtain students’ scores, the questionnaires were coded and the class teachers were asked to distribute them to the students according to the code. After the collection, the average scores of each student’s last four HSK (Chinese proficiency test) mock exams were used as the score variables.

Statistical Methods

Data were analyzed using SPSS v.22 (IBM Corp.: Armonk, NY) for descriptive, correlation, and difference tests, and Mplus v.7 (Muthén & Muthén, LA: CA) was used to evaluate the fit of each of the three measurement models. Then structural equation modeling analysis was conducted to test the mediating effect of campus adaptation of international students in China between Chinese language learning anxiety and psychological adaptation. Sequential tests and bootstrapping were used, ie, a sample with put-back sampling to obtain the standard errors of parameter estimates and confidence intervals, and where a 95% confidence interval did not include 0, a mediating effect was indicated.³⁵ The model fit indicators and their criteria used in this paper included $<1 < \chi^2/df < 3$, RMSEA < 0.082 , CFI > 0.9 , TLI > 0.9 , and SRMR < 0.063 .³⁶

Results

Common Method Bias Test

The data of the four questionnaires on Chinese language learning anxiety, campus adaptation, psychological adaptation, and academic toughness all came from the same participants, suggesting that common method bias may occur. To control the possible bias, measures such as anonymity, reverse items, emphasis on independent responses, and confidentiality of information were taken. However, the consistency of the testing environment and the homogeneity of the participant sources may still have caused covariation between the independent and dependent variables. Thus, after data recovery, we tested for common method bias. Harman’s single-factor test was performed for unrotated exploratory factor analysis on all variables, and the results revealed 11 factors with characteristic roots greater than 1. The variance of the first factor was $28.308\% < 40\%$, and a single factor could not explain the variance of the dependent variable. Thus, there was no significant common method bias in this study.

Descriptive Statistics, Correlations and Tests of Variance for Each Variable

Table 1 lists the means, standard deviations and correlation coefficients of each variable. The results show that all variables are significantly correlated with each other, specifically. The indicators of Chinese language learning anxiety were significantly correlated with the indicators of campus adaptability, academic toughness and psychological depression level, and the stronger the language learning anxiety, the poorer students’ campus adaptability, academic toughness and psychological health were. Additionally, achievement was significantly correlated with each dimension of anxiety, and the better the achievement, the lower the level of anxiety. Gender and grades were correlated, and the independent samples *t*-test showed $P < 0.05$. The grades of male students ($n=165$, $M=204.5$, $SD=58.95$) were significantly lower than those of female students ($n=131$, $M=230.6$, $SD=43.73$). Finally, Table 2 shows the results of ANOVA for levels of academic anxiety, campus adjustment, academic resilience, and psychological depression by students’ regions of origin.

Significance Test of the Mediating Effect

The results of the mediating effects model showed a good model fit: $\chi^2/df=2.21$, RMSEA = 0.064, CFI = 0.942, TLI = 0.8925, SRMR = 0.051, and 90% confidence interval for RMSEA was [0.051, 0.078]. Table 3 shows the unstandardized estimates of the total effect, the direct effect for each indirect path, and the 95% confidence interval for the mediating effect. A confidence interval that does not contain 0 indicates that the indirect effect is significant.³⁷ Table 3 shows the 95% confidence intervals of all three indirect paths did not contain 0, indicating significant mediating effects of campus adaptation and academic resilience, and significant chain mediating effects of campus adaptation and academic resilience.

Table 1 Mean, Standard Deviation and Correlation Coefficient of Each Variable

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Classroom anxiety														
2 Expression anxiety	0.680**													
3 Examination anxiety	0.497**	0.627**												
4 Negative assessment anxiety	0.609**	0.737**	0.578**											
5 Course adaptation	0.393**	0.347**	0.264**	0.305**										
6 Extracurricular adaptation	0.293**	0.314**	0.244**	0.253**	0.369**									
7 Learning adaptation	0.372**	0.384**	0.286**	0.300**	0.367**	0.565**								
8 Perseverance	0.208**	0.314**	0.228**	0.291**	0.305**	0.172**	0.287**							
9 Help-seeking	0.224**	0.267**	0.307**	0.298**	0.279**	0.129*	0.173**	0.466**						
10 Negative emotions	0.404**	0.375**	0.333**	0.311**	0.285**	0.180**	0.135*	0.389**	0.385**					
11 Depression	0.370**	0.467**	0.301**	0.393**	0.392**	0.298**	0.304**	0.297**	0.240**	0.279**				
12 Mental Emotion	0.176**	0.344**	0.239**	0.319**	0.337**	0.237**	0.288**	0.411**	0.325**	0.236**	0.485**			
13 Somatic disorders	0.244**	0.302**	0.208**	0.243**	0.203**	0.235**	0.178**	0.159**	0.227**	0.211**	0.492**	0.342**		
14 Psychomotor	0.221**	0.285**	0.190**	0.268**	0.230**	0.150**	0.210**	0.176**	0.236**	0.137*	0.428**	0.503**	0.288**	
M	3.173	3.468	3.260	3.339	3.829	3.806	3.956	4.199	4.131	3.908	3.962	3.780	3.776	3.466
SD	0.943	0.877	0.856	1.002	0.722	0.730	0.704	0.624	0.559	0.660	0.808	0.768	0.779	0.704

Notes: $p < 0.01^{**}$; $p < 0.5^{*}$.

Table 2 Analysis of Variance for Learning Anxiety, School Adjustment, and Mental Health in Each Region

		Southeast Asia	Central Asia	Europe	Africa	South America	F (4291)	Bias η^2
Chinese Language Learning	<i>m</i> ± <i>sd</i>	3.01±0.56	3.47±0.8	2.62±0.9	3.472±0.75	3.03±1.14	2.317**	0.005
Anxiety	<i>m</i> ± <i>sd</i>	4.00±0.42	4.05±0.48	3.9±0.7	4.2±0.46	4.2±0.8	7.434**	0.07
Campus Adaptation	<i>m</i> ± <i>sd</i>	3.61±0.55	3.87±0.52	3.15±0.66	3.77±0.64	3.63±0.33	5.051**	0.025
Academic Resilience	<i>m</i> ± <i>sd</i>	3.8±0.67	3.97±0.67	3.58±0.94	4.14±0.72	3.87±0.85	2.929**	0.018

Note: $P < 0.01^{**}$.

Abbreviations: *m*, mean; *sd*, standard deviation.

Table 3 Analysis of the Mediated Model of Chinese Learning Anxiety and Mental Health

	Point Estimate	S.E.	Z	Bootstrapping (95% CI)	
				Lower	Upper
Total effect	0.514	0.073	7.054	0.378	0.655
Indirect effects	0.3	0.064	4.682	0.187	0.437
Chinese learning anxiety - Academic Resilience - Mental Health	0.123	0.053	2.3	0.034	0.256
Chinese learning anxiety - Campus Adaptation - Mental Health	0.141	0.058	2.422	0.045	0.283
Chinese learning anxiety - Campus Adaptation - Academic Resilience - Mental Health	0.036	0.024	1.494	0.003	0.103
See direct effect	0.215	0.088	2.453	0.037	0.377

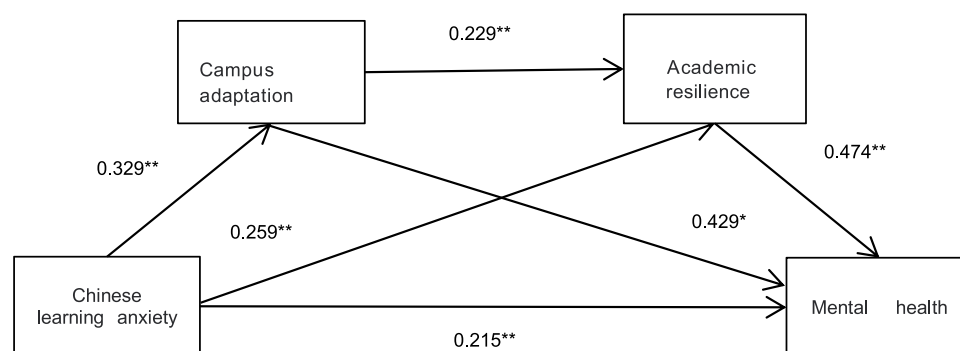
Note: bootstrap=5000.

Abbreviations: S.E., standard error; Z, z-score.

The mediating effects of campus adaptation and academic resilience were significant, together with a significant chain mediating effect of campus adaptation and academic resilience. Campus adaptation and academic resilience have partial mediating effect between Chinese learning anxiety and mental health (see Figure 1).

Discussion

Research on the psychological well-being of international students in China is of great importance. Previous studies have focused on factors that influence international students' psychological adjustment, such as gender, country or region, time spent in the target language country, time spent learning Chinese, stress (including study stress, homesickness, discrimination, and stress coping), social support, language proficiency, language barrier problems, personality, self-efficacy, and cross-cultural adjustment. Guided by these research ideas, this paper selected relevant – but more detailed factors – from these influences, such as second language learning anxiety in learning stress, and academic adaptation and

**Figure 1** Chain mediation model of Chinese learning anxiety affecting mental health.

Note: $P < 0.01^{**}$.

resilience in cross-cultural adaptation. We constructed a mediating model that also considered levels of psychological depression, to help understand the mechanism and conditions of Chinese language learning anxiety on the psychological health of international students in China, and to improve their psychological adaptation and health. This study helped address the question of the mechanisms and conditions of Chinese language learning anxiety on the psychological health of international students in China, and has theoretical and practical significance for improving international students' psychological adaptation and health.

Characteristics of the Mental Health of International Students in China

This study examined the relationship between demographic variables and the psychological adaptability of international students in China. First, in terms of gender, none of the correlations between gender and psychological adjustment in this study were significant. International students' psychological adjustment is a scholarly concern, and some researchers have concluded that students of different genders adjust differently.³⁸ However, the overall cross-cultural psychological adjustment of male and female students did not appear significantly different, a finding supported by our study and earlier work of Zhu.³²

Second, the correlation between age and psychological adjustment was also not significant in this study, probably because participants were not very heterogeneous in age – almost all had just graduated from high school. In addition, with regard to international students' regions of origin, the psychological adjustment of international students from Central Asia was significantly better than that of international students from Southeast Asia and Europe. International students from Central and Southeast Asia performed significantly better than those from Africa. Overall, European students had the highest level of Chinese language learning anxiety and average psychological adjustment; their grades were at an intermediate level. International students from Central Asia had the lowest level of Chinese learning anxiety, the greatest psychological adjustment, and significantly better grades than students from other regions.

The Mediating Role of Campus Adaptability and Academic Resilience

The results verified that Chinese language learning anxiety, campus adaptation and academic resilience all significantly predicted the psychological health of international students. International students in China face stress from Chinese language learning, and Chinese language learning anxiety is a stressor. Therefore, improving their campus adaptation and academic resilience may enable international students to address their mental health more actively, ultimately improving mental health outcomes.

This study found that international students with high levels of Chinese language learning anxiety are likely to have poorer psychological health. Many studies have shown that international students' learning stress and language learning anxiety affect their psychological wellbeing. Learning anxiety usually manifests as tension, fear, worry, and exhaustion after class, and these emotions or states are bound to have negative effects on many aspects of students' lives, leading to depression and other mental health challenges, somatic and motor disorders. Pre-college international students in China have very clear learning goals, ie, to pass the final examination of the Incoming Chinese University Foundation. Therefore, some international students lose sleep because they worry about not passing the examination, or lose significant weight because they struggle to eat. Other students feel that their lives are meaningless and worry about negative evaluations from their teachers.

In this context of cross-cultural education, international students in China will inevitably develop anxiety. First, international student managers should help students establish a reasonable cognitive state, develop a scientific understanding of anxiety, and deal with anxiety appropriately. They should encourage students to find ways to relieve anxiety, such as talking to teachers, classmates, family members and friends to help mitigate anxiety when they encounter problems. Listening to music, breathing exercises, meditation and physical activities may also help relieve anxiety. Schools should actively conduct mental health education classes to teach students techniques to relieve anxiety, and provide professional counseling for students with severe difficulties. Additional campus activities should also be carried out to help students cope with their anxiety.

Campus adaptation of international students in China mediates the relationship between Chinese language learning anxiety and psychological health. International students who adapt well to campus life can respond more quickly and

positively to the anxiety caused by learning Chinese. The lives of international students are based mainly on campus. Thus, if they can adapt effectively to campus life – eg, adapting to the Chinese language courses, the speed of lectures and teachers' explanations, the curriculum, places to study, the school cafeteria and not spending time cooking – international students will have fewer concerns. In contrast, students who struggle to adapt have many problems to overcome and associated psychological discomfort, ie, poor psychological adaptability.

Mental toughness mediates the relationship between Chinese language learning anxiety and psychological health. When international students face heavy Chinese learning pressure with insufficient psychological resources, they constantly deplete their energy to cope with learning anxiety and other difficulties. Their academic toughness is insufficient and their mental health may be affected through less positive regulation, which leads to depression.

Chinese language learning anxiety predicted mental health through a chain mediating effect of campus adaptation and academic resilience. The campus adaptation of international students in anxiety-provoking situations was affected and prevented them from diverting their attention from negative stimuli. Ultimately, their academic resilience was reduced and depression was likely. The chain mediating effect serves to remind college mental health workers that the negative effects of anxiety and campus adjustment difficulties on students' psychological health can be blocked by enhancing academic resilience of international students in China. Schools, teachers and parents should provide guidance and education to students to help them maintain an optimistic attitude in the face of stress, and improve their ability to control their emotions, thereby enhancing their academic resilience levels. Schools should regularly conduct psychological screening and establish psychological profiles of their students to understand students' psychological dynamics. Students need to learn how to improve their mental toughness, and professional psychological counseling should be available to help students who need intervention.

In conclusion, examination of the mediating role of campus adaptation and academic resilience of international students in China was helpful to understand the mechanism of the effect of language learning anxiety on mental health, and the factors that affect the cross-cultural mental health of international students. Although there are studies on learning anxiety, cross-cultural mental health and campus adaptation of international students in China, there are fewer studies focusing on academic resilience in this context. Thus, this study explored the relationship between these four factors and constructed a structural equation model that fit the data well. The model provides a deeper understanding of the factors affecting the mental health of international students in China.

Limitations and Practical Implications

This study has several shortcomings, which included the following: Firstly, as a cross-sectional study, we could not examine the causal relationship between variables, and the proportion of mediating effects may have errors. A longitudinal study could be used in the future to examine the causal and bidirectional relationships between variables. Secondly, the range of participants selected for this study was not broad enough to represent all international students, and the findings cannot, thus, be generalized beyond the specific context. Lastly, more complex models should be considered in the future because Chinese language learning anxiety and campus adaptation and academic resilience can only partially predict the mental health of international students.

The practical significance of this study is to help administrators of international students in colleges and universities to better understand the psychological health, campus adaptation and academic resilience of international students in China. This knowledge could be used to provide international students with more adaptable campus living and learning conditions, focus on humanistic care and psychological guidance, create a more harmonious campus culture, and strengthen the ability to manage frustration related to education, ultimately promoting the optimal development of international students. The results could also be studied by Chinese language teachers with a view to attracting more international students to study in China. Chinese teachers should develop their understanding of students' anxiety in learning Chinese. Teachers and administrators need to cooperate with each other to improve the quality of international students' learning experiences and their cross-cultural adaptation. More research is needed that focuses on cross-cultural adaptation of international students in China, considering the importance of the psychological health of this population, the impact on individuals and society, and to promote China's international image.

Conclusion

This study led to the following conclusions. Firstly, when the Chinese learning anxiety of international students in China is strong, their campus adaptation and psychological resilience is reduced, and levels of depression increase. Secondly, grades are significantly correlated with anxiety dimensions, and higher grades are associated with lower anxiety levels. Lastly, the mediating effects of campus adaptation and academic resilience were significant, together with a significant chain mediating effect of campus adaptation and academic resilience.

Ethical Statement

Our study complies with the Declaration of Helsinki. Our study was approved by the Research Ethics Committee of Nanjing Normal University, with all participants providing informed consent.

Acknowledgments

The authors acknowledge people who participated in this study by filling in the questionnaires.

Disclosure

The authors declare that they have no conflicts of interest in this work.

References

1. Poyrazli S, Arbona C, Nora A, McPherson R, Pisecco S. Relation between assertiveness, academic self-efficacy, and psychosocial adjustment among international graduate students. *J Coll Stud Dev*. 2002;43:632–642.
2. Misra R, Crist M, Burant CJ. Relationships among life stress, social support, academic stressors, and reactions to stressors of international students in the United States. *Int J Stress Manag*. 2003;10(2):137–157. doi:10.1037/1072-5245.10.2.137
3. Sandhu DS, Asrabadi BR. Development of an acculturative stress scale for international students: preliminary findings. *Psychol Rep*. 1994;75(1):435–448. doi:10.2466/pr0.1994.75.1.435
4. Trigueros R, Padilla A, Aguilar-Parra JM, et al. The influence of teachers on motivation and academic stress and their effect on the learning strategies of university students. *IJERPH*. 2020;17(23):9089. doi:10.3390/ijerph17239089
5. Horwitz EK, Horwitz MB, Cope J. Foreign language classroom anxiety. *Mod Lang J*. 1986;70(2):125–132. doi:10.1111/j.1540-4781.1986.tb05256.x
6. Searle W, Ward C. The prediction of psychological and sociocultural adjustment during cross-cultural transitions. *Int J Intercultur Relat*. 1990;14(4):449–464. doi:10.1016/0147-1767(90)90030-Z
7. Hu F, Cui LC, Gao L. A survey on the mental health status of international students in China. *J Clin Psychosomat Disord*. 2007;1:40–41. doi:10.3969/j.issn.1672-187X
8. Yiyi L. Research on cross-cultural psychological adjustment of international students in China. *Education*. 2020;26:7–8.
9. Chang YZ, Chen H. A study of cross-cultural adaptation stages of international students in China. Poster presented at: Research on the Education of International Students in Beijing Universities; 2008; Beijing.
10. Andrade MS. International students in English-speaking universities: adjustment factors. *Jnl Res Intern Educ*. 2006;5(2):131–154. doi:10.1177/1475240906065589
11. Brown L. The incidence of study-related stress in international students in the initial stage of the International Sojourn. *J Stud Int Educ*. 2008;12(1):5–28. doi:10.1177/1028315306291587
12. Hailemariam ST. *Academic Adaptation Experiences of International Graduate Students at Northeast Normal University*. Northeast Normal University; 2011.
13. Zhou Y. Understanding of international graduate students' academic adaptation to a US Graduate School. *Int Educ*. 2011;41:76–94.
14. Mori SC. Addressing the mental health concerns of international students. *J Counsel Dev*. 2000;78(2):137–144. doi:10.1002/j.1556-6676.2000.tb02571.x
15. Constantine MG, Kindaichi M, Okazaki S, Gainor KA, Baden AL. A qualitative investigation of the cultural adjustment experiences of Asian International College Women. *Cultur Divers Ethnic Minor Psychol*. 2005;11(2):162–175. doi:10.1037/1099-9809.11.2.162
16. Kuo YC, Walker AE, Schroder KEE, Belland BR. Interaction, Internet self-efficacy, and self-regulated learning as predictors of student satisfaction in online education courses. *Internet Higher Educ*. 2014;20:35–50. doi:10.1016/j.iheduc.2013.10.001
17. Wang CCD, Mallinckrodt B. Acculturation, attachment, and psychosocial adjustment of Chinese/Taiwanese international students. *J Couns Psychol*. 2006;53(4):422–433. doi:10.1037/0022-0167.53.4.422
18. Martin AJ. Academic buoyancy and academic resilience: exploring 'everyday' and 'classic' resilience in the face of academic adversity. *Sch Psychol Int*. 2013;34(5):488–500. doi:10.1177/0143034312472759
19. Masten AS. Ordinary magic: resilience processes in development. *Am Psychologist*. 2001;56(3):227–238. doi:10.1037/0003-066X.56.3.227
20. Bandura A, Freeman WH, Lightsey R. Self-efficacy: the exercise of control. *J Cogn Psychother*. 1999;13(2):158–166. doi:10.1891/0889-8391.13.2.158
21. Martin AJ, Marsh HW. Academic buoyancy: towards an understanding of students' everyday academic resilience. *J Sch Psychol*. 2008;31:53–83.
22. Jowkar B, Kohoulat N, Zakeri H. Family communication patterns and academic resilience. *Procedia Soc Behav Sci*. 2011;29:87–90. doi:10.1016/j.sbspro.2011.11.210

23. Sosa T, Gomez K. Connecting teacher efficacy beliefs in promoting resilience to support of Latino Students. *Urban Educ.* **2012**;47(5):876–909. doi:10.1177/0042085912446033
24. Berdida DJE, Grande RAN. Quality of life and academic resilience of Filipino nursing students during the COVID-19 pandemic: a cross-sectional study. *Int J Nurs Educ Scholarsh.* **2021**;18(1):20210115. doi:10.1515/ijnes-2021-0115
25. Grande RAN, Berdida DJE, Santos KCP, Pangket P, Cabansag DI. Structural equation modeling of the relationship between nursing students' quality of life and academic resilience. *J Taibah Univ Med Sci.* **2022**;17(4):667–677. doi:10.1016/j.jtumed.2021.11.009
26. Wu CG, Xiang XY, Xie Y. A comparison of the mental health status and coping styles of international and Chinese students in China. *Chin J Clin Psychol.* **2010**;02(18):252–253. doi:10.16128/j.cnki.1005-3611.2010.02.040
27. Edell-Gustafsson UM, Hetta JE. Fragmented sleep and tiredness in males and females one year after percutaneous transluminal coronary angioplasty (PTCA)*. *J Adv Nurs.* **2001**;34(2):203–211. doi:10.1046/j.1365-2648.2001.01746.x
28. Huang XN, Ma JJ, Xia M, Xu MJ, Yang XG. A study on the relationship between occupational stress, psychological capital, and sleep quality among rural primary and secondary school teachers. *Chongqing Med.* **2016**;12(45):1675–1677.
29. Zhang D, Xueqing H, Liu Q. Stress and sleep quality among university students: the chain mediating role of ruminative thinking and mental toughness. *Psychol Sci.* **2021**;01(44):90–96. doi:10.16719/j.cnki.1671-6981.20210113
30. Cassidy S. The Academic Resilience Scale (ARS-30): a new multidimensional construct measure. *Front Psychol.* **2016**;7. doi:10.3389/fpsyg.2016.01787
31. Shi R. A study on the status, causes and coping styles of Chinese language learning anxiety among international students; **2005**.
32. Zhu G. *A Study on the Cross-Cultural Adaptation of International Students in China in Higher Education* [dissertation]. Shanghai: East China Normal University; **2011**.
33. Wang D. *A Study on the Extraction of Cross-Cultural Adaptability Rules for International Students* [dissertation]. Nanjing: Nanjing Normal University; **2013**.
34. Xiao Y. *Study on Learning Adaptation of Preparatory Students in China* [dissertation]. Jinan: Shandong University; **2018**.
35. Erceg-Hurn DM, Mirosevich VM. Modern robust statistical methods: an easy way to maximize the accuracy and power of your research. *Am Psychologist.* **2008**;63(7):591–601. doi:10.1037/0003-066X.63.7.591
36. Kline RB. *Principles and Practice of Structural Equation Modeling*. 2nd ed. Guilford publications; **2004**.
37. Shrout PE, Bolger N. Mediation in experimental and nonexperimental studies: new procedures and recommendations. *Psychol Methods.* **2002**;7(4):422–445. doi:10.1037/1082-989X.7.4.422
38. Dao TK, Donghyuck L, Chang HL. Acculturation level, perceived English fluency, perceived social support level, and depression among Taiwanese international students. *Coll Stud J.* **2007**;41(2):287–295.

Psychology Research and Behavior Management

Dovepress

Publish your work in this journal

Psychology Research and Behavior Management is an international, peer-reviewed, open access journal focusing on the science of psychology and its application in behavior management to develop improved outcomes in the clinical, educational, sports and business arenas. Specific topics covered in the journal include: Neuroscience, memory and decision making; Behavior modification and management; Clinical applications; Business and sports performance management; Social and developmental studies; Animal studies. The manuscript management system is completely online and includes a very quick and fair peer-review system, which is all easy to use. Visit <http://www.dovepress.com/testimonials.php> to read real quotes from published authors.

Submit your manuscript here: <https://www.dovepress.com/psychology-research-and-behavior-management-journal>