



Examining the reliability and validity of adapted LASRS-2 in the Chinese context using the AMOS-SEM approach



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ABSTRACT

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This pilot study aimed to examine the reliability and validity of the Lakaev Academic Stress Response Scale-2 (LASRS-2) in the context of Chinese college students. 186 undergraduate students from Xinyang College, China were enlisted for this research. Confirmatory Factor Analysis (CFA) was used to analyze data using the Amos Structural Equation Modeling (AMOS-SEM) methodology. Factor loading and composite reliability (CR) were used to identify the reliability criteria. Moreover, the average variance extracted (AVE) was used as an index of convergent validity and the heterotrait-monotrait criterion (HTMT) as the index of discriminant validity. The research results showed that the adapted LASRS-2 has good reliability and validity indicators after minor modifications for Chinese college students. The adapted LASRS-2 can be used in the future related to research in the Chinese context. The adapted LASRS-2 can measure college students' academic stress response involving four domains (affective response, behavioral response, cognitive response, and physiological response).

Contribution/Originality: This study translated and organized the original LASRS-2 into the Chinese language and is the first pilot study conducted on undergraduate students at Xinyang College. The adapted LASRS-2 has shown good reliability and validity indicators based on the collected data and item analysis.

1. INTRODUCTION

The COVID-19 epidemic, which broke out at the end of 2019 is a challenge to all mankind. This sudden worldwide public health crisis is one of the most widespread and deadly public health disasters that has had a substantial impact on all aspects of human society, including education, economy, politics, culture, etc. (Chakraborty & Maity, 2020; Fernandes, 2020; Miyah, Benjelloun, Lairini, & Lahrichi, 2022; Onyeaka, Anumudu, Al-Sharify, Egele-Godswill, & Mbaegbu, 2021; Reuge et al., 2021; Zancajo, Verger, & Bolea, 2022). During this stage, lots of empirical studies have shown that in different occupations and age groups, stressors and stress responses are significantly negatively correlated with the mental health of the subjects, such as their level of well-being (Birditt, Turkelson, Fingerman, Polenick, & Oya, 2021; Brodeur, Clark, Fleche, & Powdthavee, 2021; Carroll et al., 2022;

Cusinato et al., 2020; de la Fuente et al., 2021; Evanoff et al., 2020; Gilleen, Santaolalla, Valdearenas, Salice, & Fusté, 2021). Academic stress is one of the many types of stress they face daily especially for undergraduate students. The online learning or e-exam mode that had to be adapted because of isolation in school or hometown would significantly improve the academic stress level (Elsalem et al., 2020; Han, Eum, Kang, & Karsten, 2022; Lee, Jeong, & Kim, 2021; She et al., 2021; Wong & Yuen, 2023; Yang, Chen, & Chen, 2021). Therefore, it is necessary to pay attention to the psychological health of undergraduate students, especially their academic stress state in the global post-pandemic period.

2. SIGNIFICANCE OF THE STUDY

Investigating the academic stress of Chinese undergraduate students during the post-pandemic period has theoretical and practical significance. Theoretically, understanding students' academic stress can indirectly help understand the mechanisms of stress and the extent to which stress affects students, leading to a series of emotional, physiological, and cognitive responses in educational psychology. This helps enrich the theories of more effective teaching strategies and support systems in education and psychology, helping students better cope with stress and improve learning achievement. Practically, studying academic stress provides insights into the psychological, emotional, and physical well-being of students. It contributes to the broader understanding of how educational environments impact mental health. Moreover, high academic stress is often linked to academic burnout and even dropout rates (Basri, Hawaldar, Nayak, & Rahiman, 2022; de la Fuente et al., 2021; Hathaisaard, Wannarit, & Pattanaseri, 2022; Hish et al., 2019; Qin et al., 2022; Sharififard, Asayesh, Hosseini, & Sepahvandi, 2020; Walburg, 2014). Understanding academic stress levels can help institutions implement measures to prevent these negative outcomes. Reducing academic stress can also have positive long-term effects on students' mental health leading to improved social well-being as these undergraduates enter the workforce (Alsultan, Alharbi, Mahmoud, & Elsharkasy, 2023; Barbayannis et al., 2022; Green, Faizi, Jalal, & Zadran, 2022; Li, Yang, Zhou, Zhao, & Liu, 2022; Yang, Xiang, Zheng, & Liang, 2022).

3. LITERATURE REVIEW

3.1. Stress

The public and scholars have paid attention to the stress of human society's development. It is described as a relationship between an individual and their surroundings that they perceive as exhausting or beyond their resources and posing a risk to their well-being (Lazarus & Folkman, 1984). There are currently three main traditions concerning the different stages of linking stress and disease: epidemiological, psychological, and biological (Cohen, Gianaros, & Manuck, 2016).

Higher levels of stress have also been linked to certain physical diseases such as cardiovascular diseases, obesity, and immune system problems (Cohen, Edmondson, & Kronish, 2015; Dhabhar, 2014; Kivimäki & Steptoe, 2018; Tomiyama, 2019) with mental health disorders such as depressive disorder, psychiatric disorders and posttraumatic stress disorder (Boyraz & Legros, 2020; Carr, Martins, Stingel, Lemgruber, & Juruena, 2013; Slavich & Irwin, 2014). Some negative stress responses are predictors of human health and disease outcomes, and they may indicate a mechanism through which psychological stress influences the emergence of future health and disease consequences (Turner et al., 2020).

3.2. Academic Stress

Academic stress is a form of stress that has been studied extensively (Cahir & Morris, 1991). Putwain (2007) believes that academic stress is a state of anxiety related to the results or consequences of students' future academic performance.

Stankovska, Dimitrovski, Angelkoska, Ibraimi, and Uka (2018) and others put forward the definition of academic stress as anxiety and stress from school and education. Academic stress is related to students and their learning environment and makes students have a negative emotional experience. Academic stress is defined in this study as a sense of tension and discomfort brought about by people's ability to manage expectations in educational settings because the study is part of the authors' larger investigation into the relationship between academic stress response and other relevant factors (Sarafino & Smith, 2014). This includes biology and psychosocial response (cognitive, emotional, and social behavior).

Previous studies have shown that there is a significant relationship between students' academic stress and academic performance, academic burnout and other factors in the educational text (Fariborz, Hadi, & Ali, 2019; Gao, 2023; Qian & Fuqiang, 2018; Ye, Posada, & Liu, 2018). Studies on college students worldwide have shown that academic stress is a major predictor of college students' mental health and academic achievement especially during the COVID-19 pandemic.

Moreover, the pandemic has raised academic, health, and lifestyle-related concerns among college students with more negative pronounced impacts on students' academic performance, social isolation, fear of contagion, and mental health (Al Mamun, Hosen, Misti, Kaggwa, & Mamun, 2021; O'Byrne, Gavin, Adamis, Lim, & McNicholas, 2021; Prowse et al., 2021; Wang et al., 2020). These issues require further research and attention given the outbreak's length and intensity.

3.3. Academic Stress Response

Stressors and stress response are both related to stress. Stress is any external or internal stimulus that triggers a biological reaction. The stress response is the body's coping mechanism (Yaribeygi, Panahi, Sahraei, Johnston, & Sahebkar, 2017). The difference is that the stressors focus on the objective stress events while the stress response research focuses on the subjective feelings of individuals about the stress events, that is, the subjective feelings generated by individuals after making cognitive judgments about the stress events such as the feeling of losing control and feeling of tension (Zhang & Zheng, 2017).

According to the model proposed by Lazarus and Folkman (1984), stress response is considered the result of an individual's cognitive evaluation of a stressful situation or event which is the ultimate response of the individual under the influence of a stressor. Stress response or reaction to stress is also seen as the body's non-specific responses to the experience of stress, including the physiological, behavioral, and emotional reactions (Crum, Jamieson, & Akinola, 2020). Generally, in this study, the definition of academic stress response is the subjective and negative reactions in both physical and mental aspects that can be consciously produced by individuals under the continuous influence of stress sources in academic environments.

3.4. Relevant Scale of Academic Stress

In general, the current measurement scales for academic stress among college students can be divided into the following two categories. The first type of scale targets students but is not limited to student groups, such as the Depression Anxiety Stress Scale (DASS-21), and Perceived Stress Scale (PSS).

The second type of scale is only applicable to measuring the academic stress of college students in a specific educational environment, such as LASRS-2, freshmen stress scale, university stress scale, Student Stress Inventory (SSI), the Academic Stress Scale (ASS), and College Student Stress Scale (CSSS).

The second type of scale which is specifically designed for student groups to measure their academic stress can also be divided into three different types of questionnaires, according to the variables of stress they measure: stressors, stress responses or symptoms, and measurements of both stressors and stress responses or reactions. Table 1 shows the names of scales, authors, target respondents and measured variables of academic stress.

Table 1. Relevant information on the scale of academic stress.

Name of scales	Authors and developers	Target respondents	Measured variables
Self-reported stress- related growth (SRG)	Frazier and Kaler (2006)	Undergraduate students	Stressors
Freshmen stress scale	Boujut and Bruchon-Schweitzer (2009)	University freshmen	Stressors
University stress scale	Stallman and Hurst (2016)	University students	Stressors
Perceived stress scale (PSS)	Cohen, Kamarck, and Mermelstein (1983)	Adult (Age above 18)	Stress responses
Lakaev academic stress response scale-2 (LASRS-2)	Lakaev (2009)	University students	Stress responses
Lipp's stress symptom inventory (LSS)	Lipp and Guevara (1994)	Adult (Age above 18)	Stress symptoms
Chinese stress symptom checklist.	Cheng and Hamid (1996)	Adult (Age above 18)	Stress symptoms
Depression anxiety stress scale (DASS-21)	Henry and Crawford (2005)	Adults and adolescents (Age above 12)	Stress symptoms
Student-life stress inventory scale.	Morris (1990)	College students	Stressors and stress responses
College student stress scale (CSSS)	Feldt (2008)	College freshmen	Stressors and stress responses
Student stress inventory (SSI)	Arip et al. (2015)	Undergraduate students	Stressors and stress responses

4. MATERIALS AND METHODS

4.1. Sample

This study adopts quantitative research methods, specifically the survey method. Convenient sampling methods are used in non-probability sampling. This research was conducted at Xinyang College, a comprehensive private university in Xinyang City, Henan Province, China. 21,649 full-time undergraduates from 20 provinces in China are receiving higher education in this school where 53 undergraduate majors are offered in this college (Xinyang College, 2022).

The minimum sample size for this study must be established using estimates based on G*Power software version 3 since it is a pilot study on the interaction between the five variables of academic stress, academic resilience, social support, coping styles, and well-being among undergraduate students at Xinyang College. G*Power is a popular statistical software program whose main purpose is to help researchers and scientists make informed decisions about the appropriate sample size for their studies or calculation of the required power level for a statistical test which is critical to optimize research efficiency and avoid under- or over-powered experiments (Faul, Erdfelder, Buchner, & Lang, 2009).

According to calculations, a total of 109 minimum sample sizes were proposed for the reference structural model in this study. However, according to earlier studies, 100–200 samples are a good starting point for path estimation analysis in structural equation models (Hoyle, 1995). Therefore, researchers used a convenient sampling method to select three undergraduate classes from Xinyang College and collected data from 190 samples, of which 4 samples were excluded due to missing data to meet this requirement. Therefore, a total of 186 valid data were collected in this study. Table 2 provides an overview of the demographic features of the total samples in this study.

Table 2. Demographic features of the participants.

Variables	Options	Total sample(n)	Percent (%)
Gender	Male	21	11.3
	Female	165	88.7
Age range	≤18 years old	29	15.6
	19-20 years old	152	81.7
	21-22 years old	5	2.7
	≥23 years old	0	0
Grade	Freshman	122	65.6
	Sophomore	64	34.4
	Junior	0	0
	Senior	0	0
Place of birth	Countryside	41	22.0
	City	145	78.5
Subject	Social science	122	65.6
	Natural science	64	34.4

4.2. Instrument

The rating scale is widely used in surveys related to social behavior research, especially in the measurement of attitudes and other subjective phenomena (Alwin, 1997). The main purpose of using the rating scale is to obtain effective information through the use of reliable procedures. The respondents were given a set of simulated questions, and they were asked to choose a point in the order corresponding to their attitude.

The questionnaires used in this study, namely the Lakaev Academic Stress Response Scale-2 (LASRS-2) were developed based on the Lakaev Academic Stress Response Scale-1 (LASRS-1) by adding items and changing the wording of some items (Lakaev, 2009). The LASRS-1 is one of the most statistically established stress measurement tools used in educational field including English-speaking and non-English-speaking countries as a well-developed modern psychometric tool for academic study (Bernstein & Chemaly, 2017). LASRS-1 examines how academic stress responses are perceived by college students in educational environments rather than concentrating on academic stressors. Lakaev (2009) analyzed the literature on academic and general stress (Cohen et al., 1983) and then he provided the items for the list, and 27 of them were tested in pilot research involving college students. Kessler et al. (2002) after undergoing principal component analysis (PCA), a 4-factor component structure (affective, behavioral, cognitive, and physiological domains) was identified. However, in previous studies, there has been little involvement in introducing the applicability of LASRS-1 or LASRS-2 in the context of Chinese college students. Therefore, it is necessary to test the reliability and validity of the LASRS-2 in the context of Chinese college students to determine its applicability in the Chinese environment.

Researchers followed the guidelines proposed by Hambleton, Merenda, and Spielberger (2004) in a book entitled, Adaptive Educational and Psychological Tests for Cross- Cultural Assessment for the adaptation and translation of the questionnaire. This is a very critical process to ensure that the questionnaire is clearly translated without loss of information or misunderstanding. In this study, the original scales of LASRS-2 were all translated into Chinese.

Two teachers from two universities in Henan Province who are proficient in English and Chinese assisted the researchers in translating and proofreading the research instruments. These two qualified language teachers have been teaching English and Chinese for more than 10 years. They are proficient in both languages, reducing measurement errors in the translation process.

Table 3 shows the codes used in this scale. The final project and its English code abbreviation are shown in Appendix A for reference.

Table 3. Code of variables and dimensions used in this scale.

Variables	Code
Academic stress	AS
Affective academic stress	AAS
Behavioral academic stress	BAS
Cognitive academic stress	CAS
Physiological academic stress	PAS

4.3. Procedures

The first step in the process of carrying out this study was to request approval from Xinyang College's Academic Integrity Association. After obtaining the admission permit from the association, the translated and examined questionnaire was uploaded to one of the most widely used online survey platforms in China: Wen Juan Xing. The data collection process was conducted in May 2023 at Xinyang College.

The online scale was distributed to participants in each classroom of the three selected classes. Participants could use their mobile app to scan and fill out the form. Before data collection, the researcher gave students a necessary introduction to the study, such as emphasizing the anonymity and confidentiality of the measurement results of the subjects. The measurement results are only for research purposes, and there is no difference between good and bad results to reduce the psychological stress of participants when completing the questionnaire. Participants were also given sufficient time to complete each item due to 26 items on the scale.

4.4. Data Analysis

Confirmatory Factor Analysis (CFA), one of the primary techniques for factor analysis is used to evaluate the indicators (items) and the structural validity and reliability of the constituents that produce the latent structure. Moreover, Structural Equation Modeling (SEM) is used to analyze relationships between observed and (latent) unobservable variables (Byrne, 2010).

In this study, the software tool AMOS 26.0 which is widely used for conducting SEM analyses, provides a user-friendly interface for specifying and estimating complex SEM. It is worth mentioning that additional plug-ins were downloaded and installed into AMOS 26.0 to provide more comprehensive index information on the reliability and validity of the questionnaire (Gaskin, James, & Lim, 2019).

5. RESULTS AND DISCUSSION

5.1. Reliability of the Adapted LASRS-2

Factor loading and composite reliability (CR) were used in this study to establish reliability standards. Specifically, composite reliability (CR) acts as the index of internal consistency reliability, and factor loading acts as the index of indicator reliability.

According to Nunnally and Bernstein (1994) the satisfied level of CR is 0.6-0.9. However, different scholars have slightly different opinions on the ideal value standard for factor loading. According to Byrne (2010) the satisfactory level of factor loading is above 0.7 while some others suggest that items with factor loadings higher than 0.5 are also acceptable (Hair, Black, Babin, Anderson, & Tatham, 2006). It's also claimed that items with factor loading below 0.4 should be deleted (Bagozzi, Yi, & Phillips, 1991). As for items with factor loading between 0.4 and 0.7, if the deletion will increase the VAE value, then they should be removed (Hair, Ringle, & Sarstedt, 2011). According to the above criteria, all items with factor loads below 0.4 in Table 4 have been deleted and items with factor loads between 0.4 and 0.7 have been adjusted. Tables 4 and 5 show the factor loading and CR before and after deletion respectively.

Table 4. Factor loading and composite reliability of LASRS-2 (Before item deletion).

First-order construct	Items	Factor loading	Composite reliability
Affective academic stress (AAS)	AAS -1	0.759	0.899
	AAS -2	0.662	
	AAS -3	0.805	
	AAS -4	0.812	
	AAS -5	0.757	
	AAS -6	0.851	
	AAS -7	0.756	
Behavioral academic stress (BAS)	BAS -1	0.755	0.773
	BAS -2	0.527	
	BAS -3	0.400	
	BAS -4	0.667	
	BAS -5	0.551	
	BAS -6	0.688	
Cognitive academic stress (CAS)	CAS-1	0.818	0.901
	CAS-2	0.683	
	CAS-3	0.693	
	CAS-4	0.699	
	CAS-5	0.685	
	CAS-6	0.831	
	CAS-7	0.842	
Physiological academic stress (PAS)	PAS-1	0.658	0.898
	PAS-2	0.761	
	PAS-3	0.779	
	PAS-4	0.789	
	PAS-5	0.783	
	PAS-6	0.850	

According to Table 4, all 26 items from the original LASRS-2 have factor loading values greater than 0.4 among which 16 of them are greater than 0.7. Therefore, the remaining 10 items with factor loading values in the range of 0.4 to 0.7 will be considered for removal or retained based on their impact on VAE values (Hair et al., 2011). After the calculations, 7 items (AAS-2, BAS-2, BAS-3, BAS-5, CAS-2, CAS-5, PAS-1) are removed from the original LASRS-2. All four factors have ideal values for composite reliability (CR).

Table 5. Factor loading and composite reliability of LASRS-2 (After item deletion).

First-order construct	Items	Factor loading	Composite reliability
Affective academic stress (AAS)	AAS -1	0.750	0.894
	AAS -3	0.813	
	AAS -4	0.824	
	AAS -5	0.776	
	AAS -6	0.868	
	AAS -7	0.743	
Behavioral academic stress (BAS)	BAS -1	0.770	0.751
	BAS -4	0.700	
	BAS -6	0.651	
Cognitive academic stress (CAS)	CAS-1	0.822	0.885
	CAS-3	0.678	
	CAS-4	0.718	
	CAS-6	0.823	
	CAS-7	0.841	
Physiological academic stress (PAS)	PAS-2	0.735	0.892
	PAS-3	0.743	
	PAS-4	0.806	
	PAS-5	0.782	
	PAS-6	0.876	

Table 5 clearly shows that after the deletion of relevant items, the adapted LASRS-2 consists of 19 items each of which has a better value of factor loading and composite reliability.

5.2. Validity of the Adapted LASRS-2

Convergent and discriminant validity were used in this study to determine the validity criteria. The heterotrait-monotrait criterion (HTMT) was utilized as the index of discriminant validity and the average variance extracted (AVE) as the index of convergent validity. According to Bagozzi and Yi (1988) an acceptable value for the AVE is over 0.5 indicating that reflective indicators with a variance of more than 50% have been regarded as being able to explain the latent variable. Table 6 shows the AVE before and after item deletion of LASRS-2. It is obvious that after combining the standards of factor loading and AVE value, the deletion of the 7 items has increased the AVE value.

Table 6. AVE value of the LASRS-2 and adapted LASRS-2.

First-order construct	AVE of LASRS-2	AVE of adapted LASRS-2
Affective academic stress (AAS)	0.599	0.635
Behavioral academic stress (BAS)	0.372	0.502
Cognitive academic stress (CAS)	0.568	0.607
Physiological academic stress (PAS)	0.596	0.624

Before and after some items' deletion, the values of HTMT are presented in Tables 7 and 8, respectively. For the HTMT, a value below 0.85 is seen as a stringent criterion (Kline, 2015).

Table 7. Heterotrait-monotrait (HTMT) criterion of LASRS-2 (Before deletion).

First-order construct	AAS	BAS	CAS	PAS
AAS				
BAS	0.710			
CAS	0.836	0.740		
PAS	0.762	0.753	0.536	

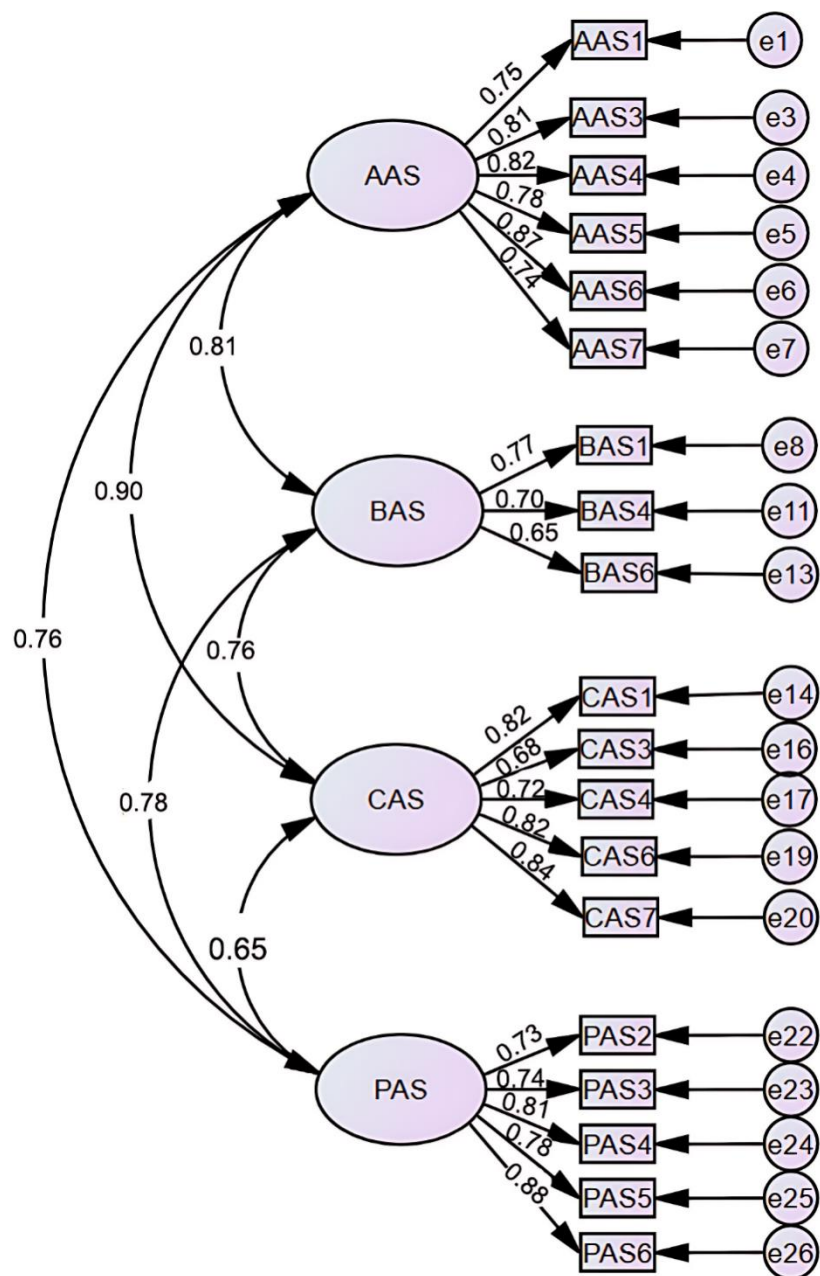
Table 8. Heterotrait-monotrait (HTMT) criterion of adapted LASRS-2 (After deletion).

First-order construct	AAS	BAS	CAS	PAS
AAS				
BAS	0.706			
CAS	0.837	0.643		
PAS	0.697	0.707	0.517	

Table 7 shows that the HTMT of original LASRS-2 consisted of 26 items meets the criterion of a value lower than 0.85. The same goes for the adapted LASRS-2 with 19 items in Table 8. After the deletion of 7 items, the adapted LASRS-2 has a satisfying validity.

5.3. Structural Equation Modeling

According to confirmatory factor analysis, the final model derived from the item deletions exhibited an excellent fit for the data (see Figure 1), chi-squared test ($p=0.000$, $df=149.000$ and $\chi^2=387.182$). Additionally, a good match to the data was shown by absolute fit indices, comparative fit indices, and parsimonious fit indices. $GFI = 0.912$, $CMIN/DF = 2.599$, $SRMR = 0.045$, $CFI = 0.930$, $NFI = 0.918$, $AGFI = 0.904$, $RMSEA = 0.043$. According to Hair et al. (2006) this model fits well in relevant indexes.



Chi-square=387.182, $df=149.000$, $p=0.000$

Figure 1. Confirmatory factor analysis of adapted LASRS-2.

This result is consistent with the research findings of Lakaev who conducted confirmatory factor analysis (CFA) on LASRS-1. LASRS-1 was composed of four factors (affective response, behavioral response, cognitive response, and physiological response) that explained 54% of the variance (Lakaev, 2009). In his other research, LASRS-2 is considered an effective and reliable psychological measurement tool for clinical, educational, and other scenarios. However, this scale is considered a one-dimensional structure (Lakaev, 2022).

6. CONCLUSION

The primary objective of this pilot study which is part of the author's PhD thesis in education is to evaluate the validity and reliability of several research tools that would be employed in a formal study. Since the research subjects of this research project are undergraduate students at Xinyang College in Xinyang City, China whose

academic stress levels need to be measured in the post-epidemic period. In contrast, LASRS-1 has been translated for usage in non-English speaking countries including Iran, the Philippines, Pakistan, and India, and is referred to in several peer-reviewed scientific papers (Bernstein & Chemaly, 2017; Chouhan & Kumar, 2011; Kumar, Bhanagari, Mohile, & Limaye, 2016). More evidence for the reliability and validity of LASRS-2 is needed. This research provides a practical empirical study collecting data in a Chinese environment.

The 26 items in the original LASRS-2 were translated, modified, and adjusted before being presented to participants in Xinyang College. Moreover, the scale that has been translated into Chinese must be rigorously tested for reliability as well as validity testing in the Chinese context taking into account the possible inapplicability of research tools due to language differences in cross-cultural research. The current research results indicate that the revised LASRS-2 has good reliability and validity among undergraduate students at Xinyang College in China. According to certain criteria, seven items were removed from the original version, and 19 items were retained. Compared to the original 26 items, the revised questionnaire has fewer items which greatly reduce the burden on participants. In addition, the four-factor model has acceptable model adaptation indicators. Thus, the adapted LASRS-2 with 19 items can be used as an ideal tool to measure the academic stress level of undergraduates during the post-epidemic stage in China.

The applicability of the revised scale in other Chinese undergraduate student groups outside of this college requires further empirical research to improve data and information due to the fact that this study only focuses on undergraduate students from Xinyang College as the research population. In addition, more data targeting Chinese undergraduate students should also be collected more widely and deeply to verify the reliability and validity of this scale, as well as to explore the quantity and nature of its factor(s).

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Institutional Review Board Statement: The Ethical Committee of the Xinyang College, China has granted approval for this study on 9 May 2023 (Ref. No. XYCLLSC-20230032).

Transparency: The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.

Competing Interests: The authors declare that they have no competing interests.

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APPENDIX A.

The scale was used with the presence of dimensions and code abbreviations.

Table A. Code and item description of original LASRS-2.

Item description	
Code	Item
<i>Dimension 1: Affective academic stress (AAS)</i>	
AAS -1	I feel overwhelmed by the demands of study.
AAS -2*	There is so much going on that I can't think straight.
AAS -3	I felt worried about coping with my studies.
AAS -4	I felt angry about unreasonable demands being asked of me.
AAS -5	I felt emotionally drained by university.
AAS -6	I felt anxious / Stressed by university.
AAS -7	My work built up so much that I felt like crying.
<i>Dimension 2: Behavioral academic stress (BAS)</i>	
BAS -1	I used alcohol, drugs, or socializing to avoid anxiety / Stress.
BAS -2*	I wanted to sleep all the time or slept all day.
BAS -3*	I avoided class.
BAS -4	I yelled at family or friends.
BAS -5*	I stayed away from friends and / Or family.
BAS -6	I have had a lot of trouble sleeping.
<i>Dimension 3: Cognitive academic stress (CAS)</i>	
CAS -1	I had trouble concentrating in class.
CAS -2*	I felt I was lazy when it came to university work.
CAS -3	My emotions stop me from studying.
CAS -4	I have trouble remembering my notes.
CAS -5*	I procrastinated on assignments.
CAS -6	I was unable to study.
CAS -7	I was distracted in class.
<i>Dimension 4: Physiological academic stress (PAS)</i>	
PAS -1*	I felt uncomfortable in the stomach.
PAS -2	I couldn't breathe.
PAS -3	I had headaches.
PAS -4	My hands were sweaty and / Or trembling.
PAS -5	I had difficulty eating.
PAS -6	My heart pounded.

Note: * Item removed in the adapted LASRS-2.

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