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Translation, cross-cultural adaptation and validation of the MBI-SS questionnaire for Chinese art students

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ABSTRACT

The 16-item Maslach Burnout Inventory-Student Survey (MBI-SS) was translated into simplified Chinese (MBI-SS-C) and tested for reliability and validity among Chinese art college students. A sample of 437 students from a Beijing art college was analyzed. The MBI-SS-C with 16 items shows relatively poor psychological measurement characteristics for items 2 and 7. The remaining 14 items showed good validity and reliability after being removed. Confirmatory factor analysis confirmed the structural validity of the 14-item MBI-SS-C. The Cronbach alpha for the MBI-SS-C was 0.854, with the three subscales having Cronbach alpha of 0.898, 0.890 and 0.902. The 14-item MBI-SS-C has a moderate correlation with general self-efficacy (GSE) and high concurrent validity. The 14-item MBI-SS-C is a reliable tool for evaluating burnout in Chinese art college students and is simple and effective.

Contribution/Originality: This study evaluated the reliability and validity of the Maslach Burnout Inventory-Student Survey (MBI-SS) in Chinese art college students. It provides a fundamental and pioneering analysis of the status and factors influencing learning burnout among Chinese art college students.

1. INTRODUCTION

The US-China trade war, COVID-19 and the Russia-Ukraine conflict have all contributed to supply chain disruptions and inflation that have slowed down global economic growth in recent years(Aharon, Aziz, & Nor, 2023; Chen, Zhang, & Miao, 2023; Diaz, Cunado, & de Gracia, 2023; Lee, Olasehinde-Williams, & Özkan, 2023). College graduates worldwide are facing increasingly severe employment pressure. China is the world's factory and a highly educated country with a vast population; therefore, the global recession has had a major effect on it. This has significantly impacted the employment landscape in China (Habibi, Habibi, & Mohammadi, 2022). It is harder for graduates of art colleges to get employment during tough times in society and the economy since they are under more pressure to find work (Stephen, 2021). Individuals must acquire additional knowledge and skills to compete in the job market. It is important to address these challenges in order to support their success. Art students often face greater employment and study pressures which can lead to burnout (Drăghici & Cazan, 2022; Liu et al., 2023).

Accurately measuring learning burnout in art students is valuable for intervening in cases of burnout. Currently, there is no measurement tool suitable for a simplified Chinese background that is specifically designed to

measure the learning burnout of Chinese art students. Developing a measurement tool suitable for the Chinese art student population is crucial. Research on Chinese college students' learning burnout has employed the Maslach Burnout Inventory-Student Survey (MBI-SS) developed by Schaufeli, Martinez, Pinto, Salanova, and Bakker (2002). However, it has not been tested whether the questionnaire is valid and reliable for Chinese art students; therefore, the accuracy of the measurement cannot be guaranteed. It is essential to ensure that the results can be compared with those of college students in other countries or majors to measure the learning burnout of Chinese art college students accurately. Professionals proficient in both Chinese and English aim to translate the MBI-SS questionnaire into simplified Chinese. The survey will be given to Chinese art college students to assess their level of academic burnout. The data collected will be used to perform reliability and validity tests and any items that do not meet the measurement criteria will be eliminated. The outcome will be a dependable and valid measuring scale for learning burnout among Chinese art college students.

The aim of this study is to evaluate the reliability and validity of MBI-SS among Chinese art students. The research questions are as follows:

1. To test whether the MBI-SS has the expected three-factor structure, namely exhaustion, learning cynicism and reduced efficacy in Chinese undergraduate art students.
2. Is MBI-SS highly reliable among Chinese college students majoring in art?
3. Check whether MBI-SS and its three subscales have an appropriate relationship with the covariate general self-efficacy (GSE) to demonstrate its effectiveness.

2. LITERATURE REVIEW

The term 'learning burnout' in academic research can be traced back to the study of 'job burnout'. Freudenberger (1974) introduced the concept of burnout while studying the work pressure of service industry personnel. He described burnout as the ongoing exhaustion, melancholy and frustration people feel when others or organisations do not value or appreciate their effort. Later, Maslach and Jackson (1986) began to further study job burnout. He believed that "job burnout is a state of mental exhaustion and emotional exhaustion which refers to a long-term reaction of individuals, including emotional exhaustion, cynicism and a low sense of accomplishment because they cannot effectively cope with various kinds of continuous pressure at work." Researchers who are conducting deeper research are starting to view burnout from the standpoint of education rather than work. Pines (1981) first proposed the concept of student burnout. Salmela-Aro and Tynkkynen (2012) demonstrated that young people in academic fields are more likely to experience burnout than those in the workforce. According to their definition, learning burnout is a situation in which students have a pessimistic attitude towards their academics and a diminished sense of passion for their studies and school-related activities resulting in a depressed state. The most influential of the many theories on the structure of learning burnout is the three-dimensional theory proposed by Maslach. Maslach and Jackson (1981) developed an important measure of burnout known as the MBI Scale which contains 22 items. The scale mainly evaluates job burnout in three dimensions: emotional exhaustion, depersonalization, and personal achievement. The MBI scale is regularly updated and optimized to meet changing needs. Currently, there are five available versions.

The General Survey (MBI-GS) version is intended for individuals who do not work in human service or educational occupations. This includes customer service, manufacturing, corporate management and other common jobs (Maslach, Schaufeli, & Leiter, 2001). A popular modification of the MBI created especially for professionals in the human services field is the Human Services Survey (MBI-HSS). It is suitable for a variety of occupations, including nurses, doctors, social workers and police officers (Maslach, Jackson, & Leiter, 1997). The MBI-HSS is a survey designed for medical personnel to assess their experience in human services (Lheureux, Truchot, Borteyrou, & Rascle, 2017). The MBI-ES is a survey designed for teachers, teaching administrators, teaching support staff and education volunteers (Firth, McIntee, McKeown, & Britton, 1985). The Survey for Students (MBI-SS) is specifically

designed for students at universities and colleges (Schaufeli et al., 2002; Yavuz & Dogan, 2014). These MBI-derived scales all have the same three-dimensional structure with similar meanings.

Scholars from various countries and cultural contexts have also tested the reliability and validity of the MBI-SS. According to the study by Wickramasinghe, Dissanayake, and Abeywardena (2018), the 15-item Sinhala version of the MBI-SS is a valid and useful instrument for measuring university student burnout. According to Montiel-Company, Subirats-Roig, Flores-Martí, Bellot-Arcís, and Almerich-Silla (2016), the MBI-HSS is feasible, effective and reliable in the measurement of dental student burnout. According to the study, burnout syndrome is highly prevalent among dental students. The authors suggest implementing interventions to reduce burnout levels in students. In 2009, Chinese scholar Hu tested the reliability and validity of Schaufeli's MBI-SS scale among Chinese students. The authors opted to keep these items in the study without altering or removing them despite the fact that decreased factor loading was noted (Hu & Schaufeli, 2009). A study by Morgan, De Bruin, and De Bruin (2014) on South African students showed that the passively worded ineffectiveness scale is more appropriate for the burnout scale's core component than the positively stated personal efficacy scale. Yavuz and Dogan (2014) conducted a study on the reliability and validity of MBI-SS among high school students in Turkey. The results indicated that the MBI-SS had a three-dimensional structure consisting of fatigue, cynicism and reduced effectiveness and demonstrated very good reliability performance. Faye-Dumanget, Carré, Le Borgne, and Boudoukha (2017) conducted research similar to this study on the validity and reliability of the MBI-SS scale in a French-speaking context using questionnaire data from 667 French university students. The results indicate that the three-dimensional structure can be maintained and the psychometric properties are satisfactory. Tsubakita and Shimazaki (2016) conducted a survey of 2061 Japanese college students who were also part of the East Asian cultural circle. The MBI-SS scale's initial 3-factor structure did not perform well on Japanese students and required revision. However, the scale can still be used to assess academic burnout among Japanese college students. Jia, Rowlinson, Kvan, Lingard, and Yip (2009); Lee et al. (2010); Moore and Loosemore (2014); Pérez-Mármol and Brown (2019) and Schaufeli et al. (2002) have shown that the factor structure of the MBI-SS scale is preserved across different cultural contexts but some items exhibit poor psychometric properties. This paper aims to test the reliability and validity of the simplified Chinese version of the MBI-SS using a sample of Chinese art students. Appropriate modifications will be made to ensure its reliability and validity.

3. RESEARCH METHODS

3.1. Participants

500 students from a Beijing art institution were chosen at random to participate in a survey for this study. Participation was voluntary and anonymous. 437 out of the 500 students answered the questionnaire obtaining 87.4% response rate. The respondents' ages ranged from 17 to 30 years old with a mean age of 21.86 years (standard deviation = 2.38) throughout the 437 valid samples. Of the respondents, 137 (31.4%) were male and 300 (68.6%) were female. Additionally, 199 (45.5%) were undergraduates and 238 (54.5%) were graduate students.

3.2. Instrument and Procedure

Translate the Maslach Burnout Inventory–Student Survey (MBI-SS) used by Schaufeli et al. (2002) in a cross-country study into simplified Chinese. The original English questionnaire for MBI-SS is shown in Table 1. The original questionnaire has 16 items in three dimensions, namely exhaustion, learning, cynicism and reduced efficacy. MBI-SS was translated into simplified Chinese by two professionals who are fluent in both Chinese and English and have worked at Chinese universities for many years. The two translators worked independently. The results show that the original English version of MBI-SS is very similar to the simplified Chinese version. Chinese college students can benefit from the translated MBI-SS questionnaire items in terms of word expression, function, and culture. The translated MBI-SS questionnaire and the original English questionnaire also had 16 items. It should

be noted that the seven items corresponding to the reduced efficacy sub-dimension are reverse scoring items (marked with R). Reverse coding should be done to these items in subsequent data analysis. The Chinese version of the MBI-SS questionnaire uses a 7-point Likert scale where 1 means very inconsistent and 7 means very consistent.

The General Self-Efficacy (GSE) questionnaire developed by Zeng, Fung, Li, Hussain, and Yu (2022) was selected as the measurement of the covariate. The GSE questionnaire has been proven to have good reliability and validity for Chinese college students. The research that has already been done includes Charkhabi, Azizi Abarghuei, and Hayati (2013); Lee, Jeon, Lee, and Jeon (2015); Rohmani and Andriani (2021) and Yang, Sun, and Jiang (2022). It is noteworthy that there is a negative relationship between GSE and learning burnout despite the fact that GSE has been shown to have a strong correlation with learning burnout. Therefore, it is reasonable to select GSE as a covariate to test the concurrent validity of the simplified Chinese version of the MBI-SS questionnaire. In this study, the GSE questionnaire uses a 4-point Likert scale with 1 indicating very inconsistent and 4 indicating very consistent. The MBI-SS questionnaire and the GSE questionnaire adopt different scoring methods which can avoid the common method deviation caused by the same questionnaire type in program design (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Table 1. Items in the initial Maslach Burnout inventory–Student survey (MBI-SS).

Exhaustion	
LB2.	I feel lonely these days and don't know what to do.
LB 5.	I feel very tired at the end of a day's study.
LB 8.	Recently, I often feel exhausted.
LB 12.	At school, I often feel exhausted.
Learning cynicism	
LB 3.	I study so badly that I really want to give up.
LB 6.	I don't think I know it anyway, so it doesn't matter whether I learn it or not.
LB 9.	In terms of studying, I don't feel a sense of accomplishment.
LB 10.	I don't think study is meaningful to me.
LB 13.	I study with a cynical attitude.
Reduced efficacy	
LB 1.	(R) I can devote myself to study energetically.
LB 4.	(R) I can often achieve my goals.
LB 7.	(R) When studying, I forget everything around me.
LB 11.	(R)I can handle the exam well.
LB 14.	(R) I can effectively solve the problems in my study.
LB 15.	(R) I can always deal with study problems easily.
LB 16.	(R) It is easy for me to master what I have learned.

Note: The label R indicates that the item is a reverse scoring item.

3.3. Data Analysis

The aim of this study was to assess the reliability and validity of the MBI-SS questionnaire among Chinese art students. A total of 437 samples were randomly divided into two groups: Sample 1 (n=218) and sample 2 (n=219). Sample 1 was used for project analysis and exploratory factor analysis while sample 2 was used for confirmatory factor analysis. Descriptive analysis was conducted on all 437 samples. Firstly, a project analysis will be conducted to determine whether to retain different projects. The analysis will use three criteria: the CR value calculated by the critical ratio method should be greater than 3 (Fan, 1952). The relationship between the items and the total score must exceed 0.4 According to (Baker, Gibson, Sufi, Barlow, & Robinson, 2015), there must be a relationship between the items and the total score that is greater than 0.4. Additionally, the scale's Cronbach alpha after removing items is not greater than the scale's overall Cronbach alpha (Pallant, 2016). The number of factors was determined by parallel analysis and the factor structure of the scale was determined by exploratory factor analysis (Çokluk Bökeoğlu & Koçak, 2016). The principal axis factoring method was used to extract factors followed by

factor rotation using the promax with the Kaiser normalization method. The resulting factor structure obtained from exploratory factor analysis was then cross validated by confirmatory factor analysis. The model's fitting effect was evaluated using standardized estimation results and a fitting index with a standardized factor loading greater than 0.5 was considered acceptable (Byrne, 2016). The ideal model fit index should satisfy: the chi-square/degrees of freedom ratio χ^2/df should be between 1 and 5, the goodness of fit index (GFI) ≥ 0.90, the Tucker-Lewis index (TLI)≥0.9, the comparative fit index (CFI)≥0.9, the root means square error of approximation (RMSEA)≤0.08. The study analyzed the convergent validity of the three sub dimensions of learning burnout. Composite Reliability (CR) and Average Variance Extracted (AVE) were used for this purpose. The Fornell-Larcker criterion was applied to assess discriminant validity. CR and AVE were calculated based on the standardized factor loading obtained from confirmatory factor analysis. The study found good convergent and discriminant validity with CR greater than 0.7 and AVE greater than 0.5 (Hair, Black, Babin, & Anderson, 2019). We used the General Self-Efficacy (GSE) questionnaire as a covariate and evaluated the correlation between GSE and MBI-SS using Pearson's correlation coefficient to assess the concurrent validity of the Chinese version of the MBI-SS questionnaire. The analysis was conducted using SPSS 26.0 and AMOS 26.0.

4. RESULTS

4.1. Descriptive and Correlation Analysis

Table 2 presents the mean, standard deviation and pairwise correlation coefficient of items in the original MBI-SS questionnaire calculated based on all samples (n=437). LB1, LB4, LB7, LB11, LB14, LB15 and LB16 are reverse-scored items that can be found alongside the positive-scored items that are essential for negative correlation. It is necessary to recode the reverse score items to show a positive relationship with the remaining questions before analyzing the data to ensure ease of understanding and accurate calculation. This will result in higher scores indicating more severe learning burnout. We can determine the factor structure of the scale by observing the correlation coefficient matrix. The questions LB2, LB5, LB8 and LB12 in the original MBI-SS questionnaire correspond to sub-dimension exhaustion. The pairwise relationship coefficient between LB5, LB8, and LB12 is high ranging from 0.72 to 0.76. However, the relationship coefficient between LB2 and these three items is low ranging from 0.33 to 0.42. Simultaneously, it was discovered that the relationship coefficient between LB2 and other sub-dimension items was higher. This suggests that fatigue may not be associated with the component corresponding to item LB2 in the MBI-SS questionnaire for the sample of Chinese art college students. This will need to be verified in the subsequent exploratory factor analysis. Table 7 also presents descriptive statistics for age, sex, covariates of the GSE and MBI-SS questionnaires and their sub-dimensions.

Table 2. Descriptive analysis and correlation analysis of the items (n = 437).

Items	Inter item correlations															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1.00															
2	-0.27	1.00														
3	-0.10	0.46	1.00													
4	0.53	-0.14	-0.11	1.00												
5	-0.06	0.33	0.30	-0.10	1.00											
6	-0.12	0.38	0.80	-0.08	0.16	1.00										
7	0.55	-0.16	0.09	0.62	-0.07	0.08	1.00									
8	-0.08	0.42	0.29	-0.15	0.72	0.15	-0.08	1.00								
9	-0.15	0.50	0.68	-0.34	0.37	0.66	-0.09	0.36	1.00							
10	-0.08	0.40	0.67	-0.18	0.21	0.75	0.01	0.23	0.67	1.00						
11	0.53	-0.17	-0.20	0.43	-0.04	-0.19	0.35	-0.02	-0.35	0.02	1.00					
12	-0.12	0.38	0.36	-0.10	0.76	0.28	-0.06	0.76	0.40	0.31	0.02	1.00				
13	0.00	0.33	0.54	0.10	0.17	0.64	0.14	0.16	0.33	0.58	0.10	0.29	1.00			
14	0.55	-0.24	-0.23	0.67	-0.05	-0.15	0.56	-0.09	-0.48	-0.20	0.69	-0.05	0.11	1.00		
15	0.43	-0.14	-0.22	0.66	-0.12	-0.16	0.57	-0.08	-0.44	-0.17	0.59	-0.12	0.09	0.82	1.00	
16	0.45	-0.09	-0.18	0.50	0.01	-0.14	0.50	0.02	-0.38	-0.13	0.62	-0.02	0.10	0.82	0.81	1.00
Mean	4.86	3.42	2.60	4.54	4.56	2.22	3.91	4.31	2.75	2.13	4.65	4.00	2.28	4.55	4.39	4.40
SD	1.41	1.96	1.58	1.53	1.77	1.45	1.59	1.93	1.90	1.68	1.57	1.86	1.65	1.50	1.50	1.43
Range	1-7	1-7	1-7	1-7	1-7	1-7	1-7	1-7	1-7	1-7	1-7	1-7	1-7	1-7	1-7	1-7

4.2. Item Analysis

Three methods were employed to analyse each item based on sample 1, the critical ratio approach, the relationship between the items and the overall score and Cronbach alpha following the deletion of items. Critical ratio analysis divides the original MBI-SS questionnaire's total score into three groups: high, medium and low based on the 27% and 73% quantiles of the overall score (Fan, 1952). An inter-group difference analysis was conducted between the high and low groups using an independent sample t-test. The critical ratio statistics obtained are shown in the second column of Table 3. It can be observed that all values are greater than 3 and significant at the 0.001 level. Subsequently, a correlation analysis was performed to obtain the correlation coefficient between each item and the total score as shown in the third column of Table 3. The correlation coefficient between item LB7 and the overall score is clearly lower than the crucial value of 0.4 among these correlation values. Additionally, we calculated Cronbach alpha after deleting items (the fourth column in Table 3) and found that the Cronbach alpha if item deleted corresponding to items LB7 (R) and LB13 was higher than the Cronbach alpha of the original MBI-SS. Removing these items is likely to improve the overall scale's reliability. Therefore, LB7 should be deleted as it does not meet two criteria. After removing LB7, the Cronbach alpha for all item deleted including LB13 was not greater than the Cronbach alpha of the whole scale. Finally, it is necessary to remove project LB7 during the item analysis stage.

Table 3. The result of item analysis (n=218).

Items	Critical ration (P-value)	Relationship between items and total score	Cronbach alpha if item deleted
LB1(R)	9.129 (P<0.001)	0.561	0.850
LB2	10.653 (P<0.001)	0.630	0.847
LB3	13.356 (P<0.001)	0.689	0.843
LB4(R)	6.347 (P<0.001)	0.535	0.851
LB5	4.373 (P<0.001)	0.471	0.855
LB6	11.846 (P<0.001)	0.634	0.846
LB7(R)	4.612 (P<0.001)	0.383	0.859
LB8	5.315 (P<0.001)	0.486	0.856
LB9	17.502 (P<0.001)	0.785	0.836
LB10	12.150 (P<0.001)	0.646	0.845
LB11(R)	7.168 (P<0.001)	0.468	0.854
LB12	5.616 (P<0.001)	0.542	0.852
LB13	6.525 (P<0.001)	0.411	0.859
LB14(R)	10.284 (P<0.001)	0.659	0.845
LB15(R)	8.475 (P<0.001)	0.625	0.847
LB16(R)	7.474 (P<0.001)	0.547	0.850
Threshold	≥3.000	≥0.400	0.858

4.3. Exploratory Factor Analysis (EFA)

The first step in the process should be the exploratory factor analysis using sample 1. LB7 was removed during the item analysis phase and will not be considered in the exploratory factor analysis. The number of factors that could be retrieved was determined using parallel analysis prior to the exploratory factor analysis(Muijs, 2010). Parallel analysis recommended extracting three components when LB7 was removed from the original MBI-SS questionnaire as shown in Figure 1(A). The principal axis factoring method is used for factor extraction while the Promax with Kaiser Normalization method is used for factor rotation. Table 4 (initial EFA) shows the pattern matrix obtained from exploratory factor analysis where each item is assigned to the factor with the highest loading. It can be observed that LB2 is grouped with LB3, LB6, LB9, LB10 and LB13 while LB5, LB8 and LB12 are grouped with LB2 on the original scale. Therefore, LB2 and LB7 should be excluded from the MBI-SS questionnaire. After their removal, the parallel analysis shown in Figure 1(B) still suggests that only 3 factors should be extracted. Factor extraction was performed using principal axis factoring and factor rotation was done

using Promax with Kaiser normalization. Table 4 (second EFA) displays the pattern matrix indicating that LB1, LB4, LB11, LB14, LB15 and LB16 should be reduced to factor 1, LB3, LB6, LB9, LB10 and LB13 should be reduced to factor 2, LB5, LB8, and LB12 should be summarized as factor 3. According to the sub-dimensions of the original MBI-SS questionnaire, these elements can be termed as follows: reduced efficacy, learning cynicism and exhaustion.
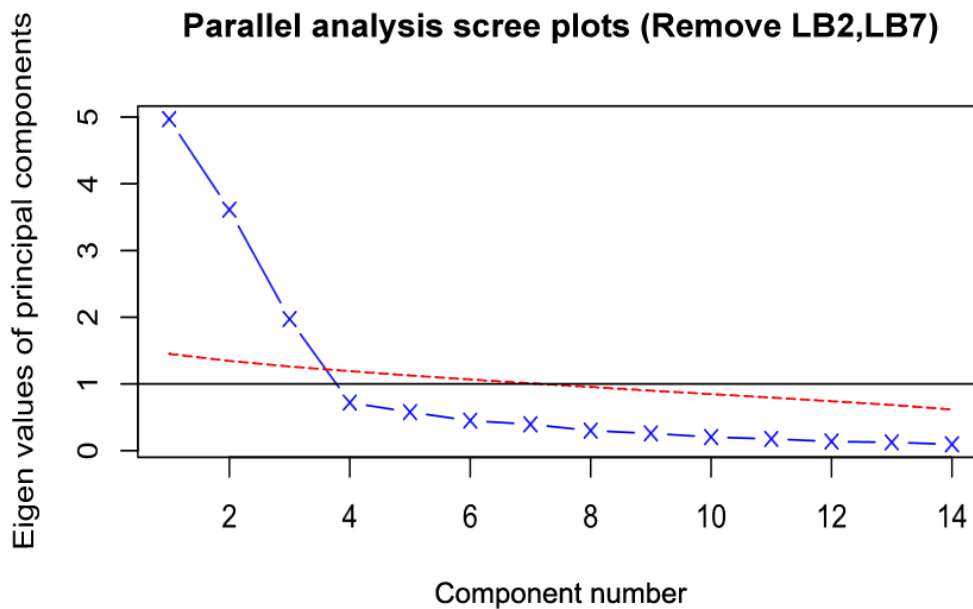
(A)
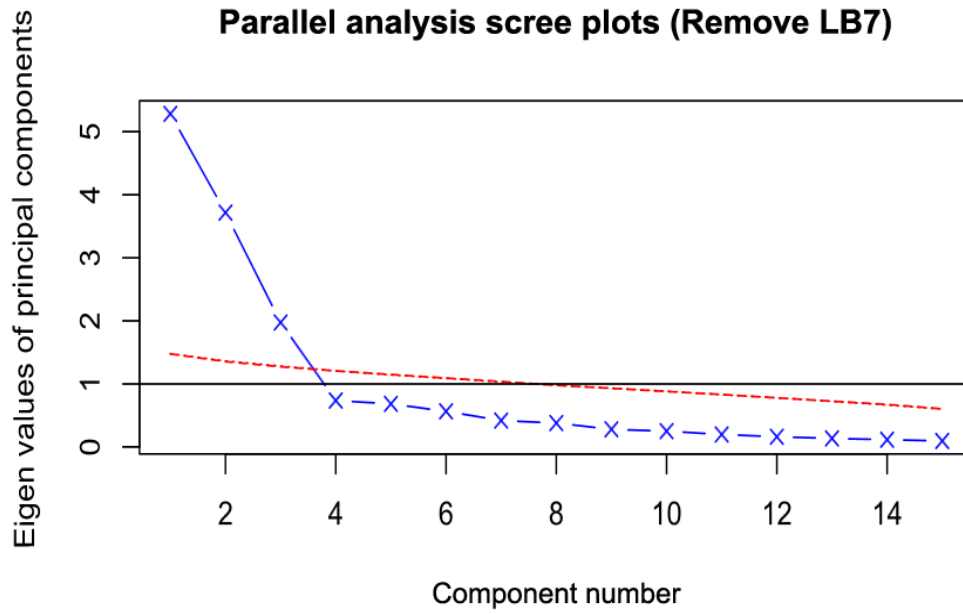
(B)

Figure 1. Parallel analysis results (A excludes item 7 and B excludes items 2 and 7).

The communalities obtained from both exploratory factor analyses were all greater than the critical value of 0.2 (Hair et al., 2019). This indicates that these items had high homogeneity with the scale.

Table 4. Factor loadings and communalities for the learning burnout scale (n=218).

Items	Initial EFA excluding item 7				Second EFA excluding items 2 and 7			
	F1	F2	F3	Communalities	1	2	3	Communalities
LB1	0.63	0.02	0.07	0.407	0.63	0.01	0.06	0.400
LB2	0.11	0.44	0.26	0.386	-	-	-	-
LB3	0.03	0.84	0.07	0.754	0.05	0.82	0.09	0.751
LB4	0.70	-0.07	0.06	0.483	0.70	-0.06	0.07	0.485
LB5	0.01	-0.04	0.83	0.661	0.02	-0.04	0.84	0.683
LB6	-0.03	0.99	-0.16	0.880	-0.02	0.99	-0.13	0.903
LB8	-0.01	-0.06	0.90	0.773	0.00	-0.06	0.88	0.735
LB9	0.29	0.68	0.11	0.706	0.31	0.65	0.13	0.683
LB10	-0.03	0.91	-0.07	0.776	-0.02	0.90	-0.04	0.778
LB11	0.74	-0.04	-0.07	0.537	0.74	-0.04	-0.07	0.537
LB12	-0.05	0.09	0.86	0.803	-0.04	0.10	0.88	0.828
LB13	-0.28	0.72	0.01	0.505	-0.26	0.71	0.03	0.505
LB14	0.95	0.06	-0.06	0.918	0.95	0.05	-0.06	0.914
LB15	0.90	-0.07	0.08	0.790	0.90	-0.06	0.09	0.797
LB16	0.86	0.00	-0.11	0.739	0.86	0.00	-0.10	0.741

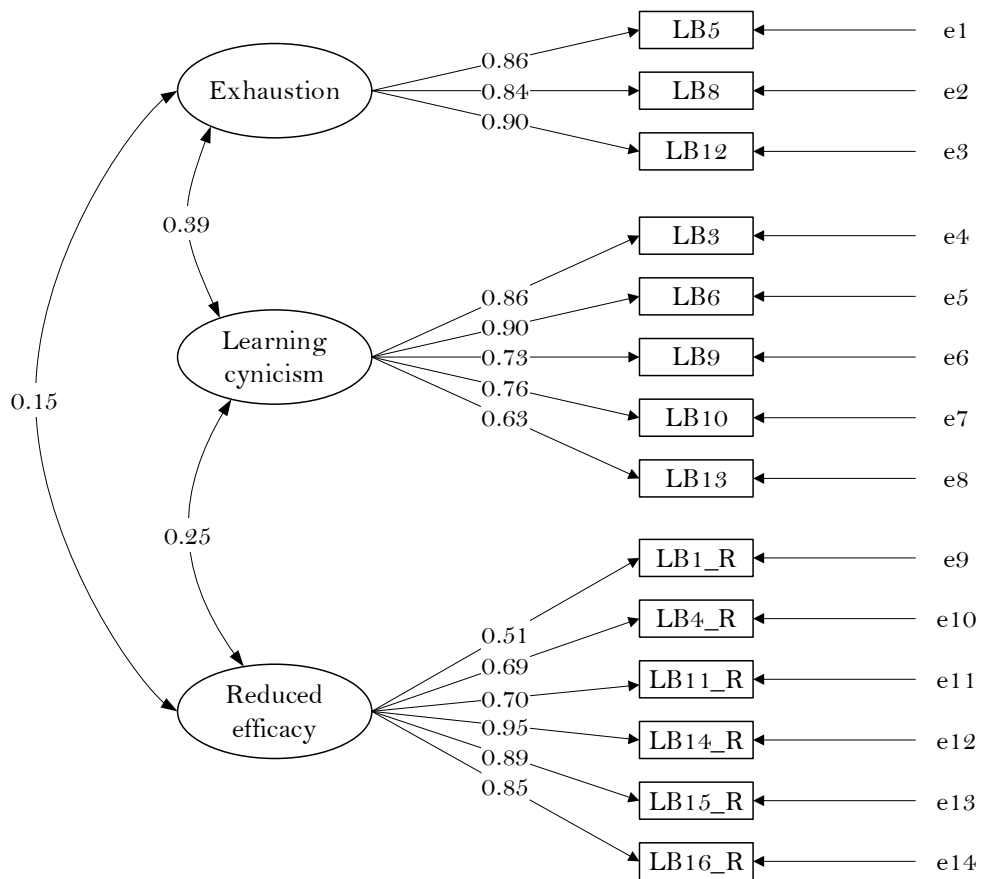**Note:** Factor; item numbers correspond with numbers in Table 1.

Figure 2. Standardized factor loadings and correlation of the final model with reduced items (n=219).

4.4. Confirmatory Factory Analysis (CFA)

It is crucial to use a different sample for cross-validation when creating, modifying, or translating a scale when exploratory factor analysis has produced a satisfactory factor structure. Byrne (2016) suggests performing confirmatory factor analysis on sample 2 (n=219) in order to verify the 3-component structure that was discovered through exploratory factor analysis. Figure 2 shows the standardized factor loadings obtained from confirmatory factor analysis and the relationships between the three sub-dimensions. The standardized factor loadings range from 0.51 to 0.95 which is reasonable. The correlation coefficients between the three sub-dimensions range from

0.15 to 0.39 indicating a low correlation among them. The fitting index of the confirmatory factor analysis model is presented below:

χ^2/df=1.401, GFI=0.956, TLI=0.984, CFI=0.987, RMSEA=0.043. These fit indices all meet the criteria given by Kline (2015).

4.5. Convergent or Discriminant Validity

The standardized factor loadings obtained from confirmatory factor analysis can be used to analyze the convergent and discriminative validity of the three sub-dimensions of the 14-item MBI-SS questionnaire. Convergent validity was assessed using Composite Reliability (CR) and Average Variance Extracted (AVE). According to Hair et al. (2019), CR should be greater than 0.7 and AVE should be greater than 0.5. Table 5 demonstrates that all three of the sub-dimensions have CR values greater than 0.7 ranging from 0.886 to 0.901. The AVE is greater than 0.5 and ranges from 0.608 to 0.753. The study used the discriminant validity test which was conducted using Fornell and Larcker (1981). According to the criterion, the square root ($\sqrt{AVE}$) of each subdimension should be higher than the maximum correlation coefficient with any other latent variable. Table 5 shows that the $\sqrt{AVE}$ of the three subdimensions is greater than their correlation coefficients with other sub-dimensions. In a nutshell, the removal of items LB2 and LB7 resulted in good convergence validity and discriminant validity for the three sub-dimensions of the MBI-SS questionnaire. This suggests that dividing the MBI-SS questionnaire into three sub-dimensions is a reasonable approach.

Table 5. The result of the convergent or discriminant validity test (n=219).

Sub-dimensions	CR	AVE	Exhaustion	Learning cynicism	Reduced efficacy
Exhaustion	0.901	0.753	0.868		
Learning cynicism	0.886	0.611	0.390***	0.782	
Reduced efficacy	0.900	0.608	0.154*	0.246**	0.780

Note: The numbers bolded diagonally are $\sqrt{AVE}$.* p < 0.050; ** p < 0.010; *** p < 0.001.

4.6. Concurrent Validity

A scale that has a significant theoretical relationship with learning burnout must be used as a covariate in order to evaluate the concurrent validity of the 14-item MBI-SS questionnaire among Chinese art college students (Lajunen & Özkan, 2011). In this study, general self-efficacy (GSE) was used as a covariate for MBI-SS. A correlation analysis was conducted between the original MBI-SS questionnaire, the 14-item MBI-SS questionnaire and general self-efficacy (GSE). The results are presented in Table 6. A significant negative relationship was found between the MBI-SS and GSE with correlation coefficients of r=-0.490 (P<0.01) and r=-0.452 (P<0.01) before and after adjustment, respectively. A significant and negative relationship was found between the MBI-SS and GSE with correlation coefficients of r=-0.490 (P<0.01) and r=-0.452 (P<0.01) before and after adjustment respectively. These results indicate a negative relationship and support the validity of the MBI-SS questionnaire.

Table 6. Pearson's correlations between covariates and learning burnout (n=437).

Scale/sub-dimensions	GSE
Sub1-exhaustion	-0.182**
Sub1-exhaustion (Excluding item 2)	-0.125**
Sub2-learning cynicism	-0.110*
Sub3-reduced efficacy	-0.661**
Sub3-reduced efficacy (Excluding item 7)	-0.638**
Learning burnout	-0.490**
Learning burnout (Excluding item 2 and 7)	-0.452**

Note: **P < 0.01; *P < 0.05.

4.7. Reliability Test

Table 7 presents the Cronbach alpha values for the MBI-SS questionnaire including its sub-dimensions before and after adjustment. The results show that after removing items LB2 and LB7, the overall Cronbach alpha of the MBI-SS questionnaire decreased from 0.864 to 0.854 with no significant change. However, the Cronbach alpha of the exhaustion sub-dimension increased from 0.834 to 0.898 while the reduced efficacy sub-dimension remained basically unchanged with a Cronbach's alpha of 0.902, down from 0.907. The removal of items LB2 and LB7 has a minimal impact on the reliability of the learning burnout scale. The main change is an increase in the reliability of sub-dimension exhaustion. It is important to note that the MBI-SS questionnaire and its sub-dimensions had good reliability both before and after the adjustment (Cronbach alpha > 0.7). Furthermore, the Cronbach alpha of the scale used to measure the covariate variable GSE was 0.921 indicating high reliability.

Table 7. Reliability test and descriptive of all study variables (n=437).

Initial variable or scale	Mean	SD	Range	Cronbach alpha
Age	21.86	2.38	17.0-30.0	–
Gender	1.69	0.46	1.0-2.0	–
GSE	2.86	0.53	1.5-4.0	0.921
Sub1-exhaustion	4.07	1.54	1.0-7.0	0.834
Sub 2-learning cynicism	2.40	1.38	1.0-7.0	0.890
Sub 3-reduced efficacy	3.53	1.20	1.0-7.0	0.907
Learning burnout	3.31	0.95	1.0-5.3	0.864
Learning burnout (Excluding item 2 and 7)	3.25	0.96	1.0-5.6	0.854
Subscales identified during exploratory factor analysis				
Reduced sub1exhaustion (Excluding item 2)	4.29	1.69	1.0-7.0	0.898
Reduced sub3-reduced efficacy (Excluding item 7)	3.43	1.22	1.0-7.0	0.902

5. DISCUSSION

This study examines the suitability of the MBI-SS questionnaire for Chinese art students. Item number seven, which has no correlation and the content, "I ignore everything around me when studying," was eliminated throughout the item analysis process. The intended meaning of this item is that when studying, one can fully concentrate on their studies allowing them to forget about their surroundings. However, the Chinese translation of this item has a low correlation with the meaning expressed on the whole scale. The correlation between LB7 and the total score of MBI-SS is only 0.383 which is less than the critical value of 0.4.

During the exploratory factor analysis, LB2 (which describes feeling empty and unsure of what to do) was removed. Although LB2 should correspond to the exhaustion sub-dimension in the original MBI-SS questionnaire, it was found to correspond to learning cynicism in the analysis. However, as LB2 describes a basic state of mind rather than learning cynicism, it was excluded from the analysis. Finally, the exploratory factor analysis yielded a solution that extracted 3 factors while preserving 14 items. The structure of the 3-factor 14-item model is like that of the 3-factor 16-item model proposed by Schaufeli et al. (2002). The revised MBI-SS questionnaire removes only LB2 in the exhaustion sub-dimension and LB7 in the reduced efficacy sub-dimension, respectively without changing the factor structure. All of the communalities were found to be greater than 0.4 in the final exploratory factor analysis model. This indicates that different items have large commonalities.

A distinct sample confirmed the stability and generalizability of the factor structure obtained from the exploratory factor analysis using confirmatory factor analysis. The results of confirmatory factor analysis showed that the standardized factor loadings ranged from 0.51 to 0.95 with no lower loadings observed. Based on standardized load values, the convergence validity indices for Composite Reliability (CR) and Average Variance Extracted (AVE) are both greater than the recommended values of 0.5 and 0.7, respectively. This suggests that the MBI-SS questionnaire's modified simplified Chinese version has strong convergent validity. The discriminant validity between the three sub-dimensions is evaluated using the Fornell-Larcker criterion. This demonstrates that

learning burnout manifests itself in different ways such as reduced efficacy, learning cynicism, and exhaustion. The MBI-SS questionnaire and GSE had a moderately negative correlation according to concurrent validity analysis that used GSE as a covariate variable. This suggests the validity of the MBI-SS questionnaire. These results suggest that the original English version of the MBI-SS questionnaire may measure the learning burnout of Chinese art students accurately and effectively with just modest alterations (i.e., the elimination of items 2 and 7).

6. CONCLUSION AND LIMITATIONS

6.1. *Conclusion*

The 14-item MBI-SS-C maintained the same 3-factor structure as the original MBI-SS after eliminating two questions with weak psychometric qualities. All psychometric statistics met the recommended values. It is worth noting that the cultural, educational and social backgrounds of the study population selected in this study may differ from those of the original MBI-SS questionnaire which resulted in two items showing unexpected and unqualified measurement characteristics. After removing the two items, the reliability and validity indexes of the adjusted MBI-SS-C questionnaire performed well. Therefore, the adjusted MBI-SS-C questionnaire in this study can be used to measure the learning burnout of Chinese art college students and can be compared with the results of other empirical studies using the original MBI-SS questionnaire provided that these two problematic items are not considered in data processing. In a nutshell, this study provides empirical evidence supporting the use of the MBI-SS questionnaire to measure learning burnout in Chinese art students. It also contributes to the empirical basis for the cross-cultural universality of the MBI-SS. The language used is clear, objective and value-neutral with a formal register and precise word choice. The text adheres to conventional structure and formatting features with consistent citation and footnote style. The grammar, spelling and punctuation are correct. No changes in content have been made.

The study's findings are similar to those of Japanese scholars. Tsubakita and Shimazaki (2016) also reported similar results. Additionally, the initial MBI-SS scale's psychometric characteristics were found to be unsatisfactory. The modified scale's CFA model fit index performed well even after removing a few items. This paper offers a revised version of the MBI-SS-C scale that eliminates two items in comparison to Schaufeli's scale which was first presented by Chinese scholars (Hu & Schaufeli, 2009). The multiple indexes of the adapted MBI-SS-C, including factor loading, structural validity, convergent validity, discriminative validity and reliability, all exceed the critical values recommended by Hair et al. (2019).

6.2. *Limitations and Future Research Directions*

This study confirms that the MBI-SS-C scale retains the 3-factor structure of the original MBI-SS scale in Chinese art college students. However, the sample of this study is limited to one Art University in Beijing which may not be representative of all art universities in China. The sample sources in this paper are limited to a specific group of art universities in China due to the uncontrollable time and financial costs of random sampling. As a result, the empirical results obtained may lack universality.

Furthermore, it is important to note that the simplified Chinese version of the MBI-SS questionnaire is a direct translation of the English version. As a result, it may not include all the necessary items to accurately reflect the learning burnout experienced by Chinese art students. It is worth mentioning that this study did not introduce any additional items to the MBI-SS questionnaire or expand the sub-dimensions of the scale. In this study, the MBI-SS questionnaire was adapted for Chinese art college students and its reliability and validity were verified. However, a new scale was not developed to comprehensively reflect learning burnout according to the cultural background of Chinese college students.

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