



Reliability and Exploratory Factor Analyses of Social Support Rating Scale

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ABSTRACT

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The measurement of social support adopts the social support rating scale developed by Ye Yuemei et al (2008) ., which consists of 17 items and is based on Xiao Shuiyuan's (1987) three factor model of social support. It includes subjective support, objective support, and utilization of support. The subjective support scale has 5 items and measures the perceived social support material and spiritual resources of the respondents; The objective support scale consists of 6 items, measuring the various forms of assistance that the respondents have truly received. The support utilization scale consisting of 6 items measures active utilization of social resources by respondents. This study aims to investigate the reliability and exploratory factor analysis of the Social Support Rating Scale.

KEYWORDS:

social support, reliability analysis, exploratory factor analysis

The research on social support can be traced back to the exploration of the impact of life stress on physical and mental health in the 1960s. Since then, the relationship between social support and physical and mental health has been widely validated (Zhang, 2022). Social support refers to the connection between the supported individual and the surrounding individuals and organizations, which can be divided into three aspects: objective support, subjective support, and individual utilization of support. Social support often directly affects an individual's mental health level, enabling them to maintain good physical and mental health.

More and more students are suffering from mental health disorders, especially those with anxiety disorders, entering the campus. Anxiety disorders can have a negative impact on the academic performance of college students (Pierce, 2020). Against the backdrop of the healthy development of China's

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market economy, the level of mental health has become one of the important criteria for measuring and evaluating talents in society. The level of mental health is not only related to students' life, learning and talent development, but also related to the overall quality of talent training in China, affecting the effectiveness of China's socialist modernization (Yang, 2022).

In addition, social support can provide individuals with certain protection when facing stress reactions, and positive social support from important others can help reduce individuals' trait anxiety levels and maintain a good emotional state (Zhang, 2022). According to Xu's (2022) research, the average scores of college students in terms of family support, friend support, and other support have decreased, and their mental health level is lower than the theoretical median. Therefore, it is necessary to investigate the relationship between social support and the mental health of college students. This study aims to investigate the reliability analysis and exploratory factor analysis of the Social Support Rating Scale. A total of 160 questionnaires were distributed and 150 valid questionnaires were collected.

The measurement of social support in this study adopts the social support assessment scale developed by Ye Yuemei et al.

(2008), which consists of 17 items and is based on Xiao Shuiyuan's (1987) three factor model of social support. It includes subjective support, objective support, and utilization of support. The subjective support scale has 5 items and measures the perceived social support material and spiritual resources of the respondents; The objective support scale consists of 6 items, measuring the various forms of assistance that the respondents have truly received; Measure the active utilization of social resources by respondents using a support utilization scale consisting of 6 items.

Reliability Analysis of Social Support Rating Scale

Reliability analysis is a test of the stability and consistency of the collected data at a scale. The higher the stability and consistency of the scale, the higher the reliability coefficient, and the lower the standard error. Churchill's (1979) research suggests the need for filtering and purifying items in pilot questionnaires. The purified project is less prone to

multidimensionality in factor analysis, more in line with the preconceptions of each construct, and more conducive to the analysis of each observed variable and latent variable. Different scholars have different opinions on the criteria for determining the total correlation coefficient and Cronbach's Alpha value of the correction term. If Cronbach's Alpha value is above 0.9, it is considered excellent; If it is 0.80-0.899, it is good; If it is 0.70-0.799, it is acceptable; If it is 0.60-0.699, it is fair and needs to be corrected; If it is 0.50-0.599, it is okay, but the coefficient is low and needs to be corrected; If it is lower than 0.50, it is unacceptable and the ratio needs to be redesigned (George et al., 2011).

After collecting research data, the data was analyzed using IBM-SPSS 26.0 software. The reliability of the social support questionnaire was tested using Cronbach's Alpha test. The reliability analysis results are as follows:

Table 1.1 Reliability Analysis of social support

Dimension	Items	Cronbach's Alpha
Subjective Support	SBS1	0.903
	SBS2	
	SBS3	
	SBS4	
	SBS5	
Utilization of Support	UOS1	0.885
	UOS2	
	UOS3	
	UOS4	
	UOS5	
	UOS6	
Objective Support	OS1	0.878
	OS2	
	OS3	
	OS4	
	OS5	
	OS6	

As shown in Table 1.1, the reliability of the three dimensions of social support is: subjective support 0.903, objective support 0.878, and utilization of support 0.885. The reliability values of all dimensions are above 0.80, which means that all items representing variables and dimensions are

acceptable.

Exploratory Factor Analysis of Social Support Rating Scale

According to Yong and Pearce (2013), factor analysis is used to summarize data in order to gain a deeper understanding of the relationships and patterns between components. Factor

analysis divides variables into a small number of clusters based on their shared variance. It helps identify design constructions. Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) are the two most commonly used methods of factor analysis. EFA focuses on exploring data to find information about its composition and structure. CFA validated the component structure obtained in EFA. It is necessary to use EFA to test the hypothesis factor structure of a set of measurements and discover whether there is any redundancy in the set of measurements (Russell, 2002). Therefore, in the early stages of research, it is often used to determine the interrelationships between variables.

In this study, following the suggestion of Gaskin and Happell (2014), principal component analysis (PCA) using maximum variance rotation method was used to extract factors. In addition, Shlens (2014) pointed out that principal component analysis provides a roadmap for reducing the complexity of a dataset to lower dimensions, which exposes the simplified and hidden structures that often exist beneath the dataset. Costello and Osborne (2005) found that principal component analysis is the most widely used method for extracting components and is highly suitable for reducing the number of items to a smaller number of representative components.

According to Field (2013), there are two types of rotations in principal component analysis: the maximum variance rotation and the skewed or oblimin rotation. The maximum variance rotation method is an orthogonal rotation that assumes that there is no correlation between components or factors. And tilted rotation allows for correlations between components or factors (Tabachnick&Fidel, 2019). An important difference between them is that they can generate interrelated or unrelated factors. In addition to the maximum variance rotation method, the orthogonal rotation method also includes fourth power, equal power, and orthogonal power.

To ensure that the study used the most suitable rotation method, varimax and oblimin rotation methods were applied to the pilot dataset for EFA. After comparing the two results of EFA, the maximum variance rotation method was chosen as the

final result because it is easier to interpret. To test the applicability of factor analysis data, the results were focused on Kaiser Meyer Olkin (KMO) measurement of sampling adequacy and Bartlett's test (BTOS) of sphericity. Test KMO and BTOS to check if the sample is sufficient. According to Kaiser's criteria, the KMO value of each construct should be higher than 0.6, and the BTOS value should be significant (p-value less than 0.05). KMO statistical information varies between 0 and 1. Specifically, 0.00 to 0.49 is not acceptable; 0.50 to 0.59 tragic; 0.60 to 0.69 moderate; 0.70 to 0.79 moderate; 0.80 to 0.89 active power; An astonishing range of 0.90 to 1.00 (Kaiser, 1974; Field, 2013). In addition, Field (2013) recommends values between 0.5 and 0.7 as average, values between 0.7 and 0.8 are good, values between 0.8 and 0.9 are good, and values above 0.9 are excellent.

In addition, Hair et al. (2018) proposed three criteria that must be used in factor analysis, which are: (1) identifying factors with eigenvalues greater than 1, (2) factor loadings for projects should be greater than 0.50, which is necessary for practical significance, and (3) cross loadings for projects should not exceed 0.50. Since all items in the questionnaire of this study were initially adopted from established items, the factor load of the items was maintained above 0.60 (Awang, 2012).

This study used exploratory factor analysis to analyze the validity of the social support scale. Before conducting exploratory factor analysis, it is necessary to first perform KMO and Bartlett's sphericity test on the scale to determine whether it is suitable for exploratory factor analysis. Generally speaking, when the KMO value is greater than 0.6, exploratory factor analysis can be performed. In addition, when the significance probability of the Bartlett sphericity test chi square statistic is less than 0.05, it can also indicate that the questionnaire data is suitable for exploratory factor analysis. Table 1.2 presents the results of the KMO and Bartlett sphericity tests for the social support scale. According to the table, the KMO value of the social support scale is 0.894, which is greater than 0.7, and the Bartlett sphericity test result (Sig=0.000) is significant, indicating that the pre survey scale is suitable for exploratory factor analysis.

Table 1.2 KMO and Bartlett's Test of Social Support

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.894
Bartlett's Test of Sphericity	Approx. Chi-Square	1378.101
	<i>df</i>	136
	<i>Sig.</i>	0

Table 1.3 shows the factor extraction of all measurement items in the scale using principal component analysis. The structure shows that three factors with eigenvalues greater than 1 were extracted, and the cumulative variance explained by the

three factors was 66.081%, which is greater than 60%. This indicates that the extracted three factors have good explanatory power for the original measurement items.

Table 1.3 Total Variance Explained for Social Support

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.65	39.119	39.119	6.65	39.119	39.119	3.846	22.622	22.622
2	2.346	13.799	52.918	2.346	13.799	52.918	3.776	22.211	44.833
3	2.238	13.163	66.081	2.238	13.163	66.081	3.612	21.249	66.081

The final scree plot (Figure 1.1) also shows that the eigenvalues of the first three factors are greater than 1, and starting from the fourth factor, the gravel plot has begun to

flatten. Therefore, selecting three common factors is more appropriate, which is consistent with the results after factor rotation.

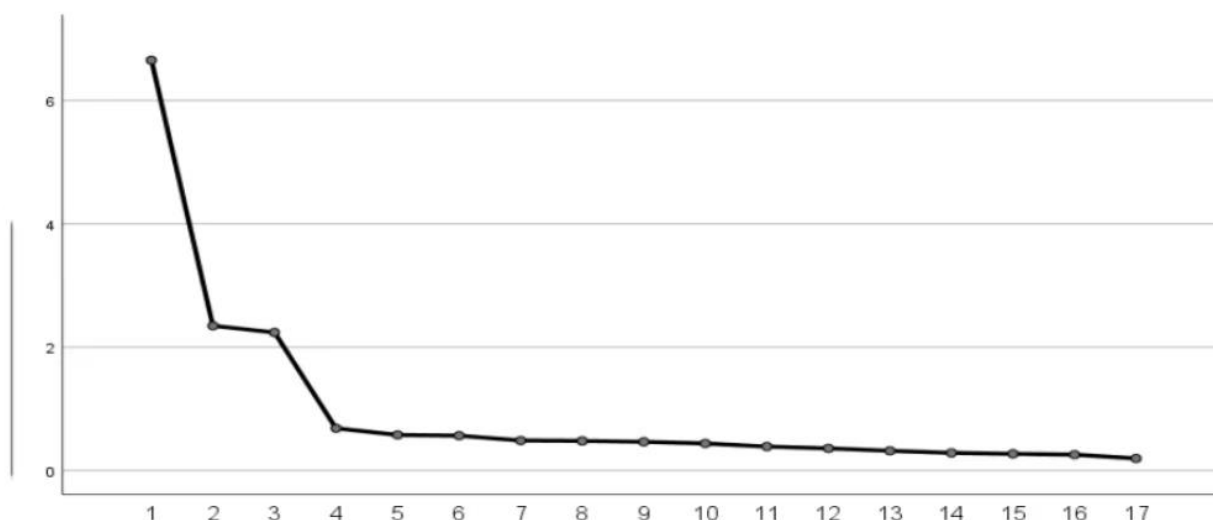


Figure 1.1 The final scree plot of Social Support

Table 1.4 presents the exploratory factor analysis results of the Social Support Scale. The results showed that three factors were extracted, namely utilization of support, objective support, and subjective support. The factor loadings of all measured items in the three factors were greater than 0.5, and each item fell into the corresponding factor. There was no cross

loading, indicating that the social support scale in this study consists of three constructs, namely utilization of support, objective support, and subjective support. Therefore, the scale has good validity.

Table 1.4 Final EFA Result of Social Support

No	Dimension	Item Label	Factor Loading□		
			1	2	3
1	Utilization of Support	UOS1	0.81		
2		UOS2	0.752		
3		UOS3	0.753		
4		UOS4	0.803		
5		UOS5	0.73		
6		UOS6	0.759		
7	Objective Support	OS1		0.768	
8		OS2		0.716	
9		OS3		0.787	
10		OS4		0.759	
11		OS5		0.74	
12		OS6		0.803	
13	Subjective Support	SBS1			0.807
14		SBS2			0.826
15		SBS3			0.821
16		SBS4			0.834
17		SBS5			0.802

In summary, the 17-question social support assessment scale developed by Ye Yuemei et al. (2008) has good reliability and validity.

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