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ORIGINAL RESEARCH

Psychometric Properties of the Chinese Version of Multidimensional Scale of Perceived Social Support

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Aim: The purpose of this study is to revise the Multidimensional Scale of Perceived Social Support and validate the reliability and validity of the Chinese version of the scale for Chinese college students.

Methods: A total of 2830 Chinese college students were tested with the Chinese version of MSPSS. Four weeks after the formal test, 80 randomly selected subjects were retested.

Results: The item analysis shows that the total correlation between each item and the total score is 0.525~0.806, higher than the standard of 0.30; the difference between the high group and the low group in all items has reached the significant level. Exploratory factor analysis shows that the scale includes three factors with a cumulative contribution rate of 69.185%; confirmatory factor analysis shows that the data is well fitted. The total score and three factors of social support scale are positively correlated with self-esteem, with a correlation value of 0.367~0.433, and negatively correlated with depression and anxiety, with correlation values of −0.356~-0.428 and −0.253~-0.308; all are significant at 0.01 level. The internal consistency coefficient of the scale is 0.911, the split-half coefficient is 0.865, and the test-retest coefficient is 0.837–0.914.

Conclusion: The Chinese version of the MSPSS has good reliability and validity, and is suitable for Chinese college students.

Keywords: college students, social support, reliability, validity

From the perspective of psychological assistance, social support plays an important role in promoting individual physical and mental health.[1,2] On the one hand, social support can mitigate negative psychological outcomes. It can act as a good barrier or buffer against the stress caused by catastrophes in life.[3–5] Adequate social support can buffer the psychological impact of negative events on individuals and reduce the negative effects of depression, anxiety, stress, low self-efficacy, loneliness or social isolation,[6–11] so as to protect the mental health of individuals. On the other hand, social support can enhance positive emotional experience. It makes individuals have more positive emotions and expectations. Favorable social support can make individuals feel higher self-efficacy, self-esteem,[12] subjective well-being,[13] psychological resilience,[14] life satisfaction,[15] level of hope,[16] and career adaptability, and can enable individuals to have a healthier lifestyle.[17] Social support is an important factor affecting individual prosocial behavior, and has a significant positive correlation with altruistic behavior,[18] thereby playing an important role in maintaining and promoting physical and mental health. Another researcher found that "The COVID-19 pandemic has highlighted the importance of social support for everyone".[19] For college students, more social support is an effective way to buffer job burnout and academic stress[1] and ameliorate problematic behavior.[20] Social support can moderate the negative impact of Internet addiction on college students' physical activity,[20] and provide safeguard favorable for college students' academic adaptation and development.[21]

Therefore, many researchers have developed a variety of measurements for social support. Among them, the MSPSS is one of the most widely used scales in recent years. Compiled by Zimet et al in 1988, the 12-item scale can measure an individual's social support from family, friends, and significant others. The scale uses Likert 7-level scores ranging from

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strongly disagree (1 point) to strongly agree (7 points); the total score ranges from 12 to 84, with higher total scores indicating greater social support. The original version of the scale is a three-factor structure with high internal consistency (α=0.88) and stability (stability coefficient α=0.85 after three months).[22,23]

The scale is widely used in many countries. In 70 studies, Dambi et al[7] retrieved 22 translations in different languages, such as Arabic women (MSPSS-AW)-USA, Arabic Generic-Lebanon, French-France, Hausa-Nigeria, Korean-Korea, Malay-Malaysia, Spanish-USA and Spain et al,[7] and recently Russian,[24] Chinese,[25] Saudi Arabia,[26] Chin-Burmese.[27] These various versions indicate the importance of the scale in measuring social support.

For the structure of the scale, some researchers extracted two subscales or factors, that is Friend and Family subscales. It is found that exploratory factor analysis yielded a two-factor structure (family vs nonfamily), while confirmatory factor analysis generally supported a three-factor structure (family, friends, and significant others). More research supported the three-factor construct.[9,11,24,28–30]

In China, the Social Support Questionnaire (PSSS) translated by Huang et al[31] is an earlier Chinese version of the MSPSS. In this PSSS, the factor analysis results are quite different from the original scale, and only two principal components are obtained, namely family endogenous support and family exogenous support; the number of subjects is small, only 206; in addition, indicators such as cumulative contribution rate of factor analysis are not reported. At present, the Perceived Social Support Scale by Jiang, Q. J.[32] is more widely used in China. However, Jiang's scale comes from the introduction of Blumenthal et al;[33] and this version translates "special person" in the original scale as "some people (leaders, relatives, colleagues)", which may confuse the subjects. Yan, B. B. and Zheng, X.[34] revised "leaders, relatives and colleagues" in the original scale to "teachers, classmates and relatives". In recent studies, many studies adopted the Perceived Social Support Scale from Jiang, Q. J.[32] or modified it slightly, "defining the 'other significant person' dimension in the scale exactly as 'teacher and classmates', to refer to the support from both teachers and classmates".[35,36] However, for students, "support from teachers and support from classmates" obviously cannot be confused, and there is also no revision on the scale text. In addition, some research notes use the version revised by Huang et al,[31] but their interpretation of the three factors of the scale is not consistent with the original one;[37] or the introduction of the Chinese version of the social support scale adopted in its text is not enough, or the structure of the scale is inconsistent with that of the original scale[38,39] and so on.

Based on the importance of the concept of social support and the extensive use of the MSPSS in China, it is necessary to verify the reliability and validity of the scale. Therefore, the author of this article contacted Zimet, G.D, the original author of the scale, and was authorized to translate and revise the scale, in order to provide an effective social support measurement for related research in China. So far, the revised scale has been validated in primary and secondary school students and has good reliability and validity.[25] At present, there is a lack of test of the scale among Chinese college students, so this study will conduct further verification in college students. Due to the significant correlation between social support and depression, anxiety,[6] and self-esteem,[34] this study used self-esteem, depression, and anxiety as the validity criterion for the scale.

Method

Participants

The cluster random sampling method was used to test 2960 college students from Shanghai University, Capital Normal University, Shanghai Second Polytechnic University, Shanghai Lixin College of Accounting, Shanghai Health Medical College, West China Normal University, Southwest University, Shaoguan College, Fudan University, Guangzhou Civil Aviation Vocational and Technical College, Shanghai University of Finance and Economics, East China University of Political Science and Law, Shanghai University of International Business and Economics, Shanghai University of Engineering and Technology, Shanghai University of Technology, Tongji University et al, and 2830 valid data were collected, with an effective rate of 95.61%.

The valid questionnaire was randomly divided into two samples: Sample 1 has 1415 participants with an average age of 19.35 (Std. deviation is 1.343), which is used for project analysis and exploratory factor analysis. In sample 1, in terms of gender, there are 690 boys (48.8%) and 725 girls (51.2%); in terms of grades, there are 932 freshmen (65.9%), 387

sophomores (27.3%), and 60 juniors (4.2%), 11 seniors (0.8%), 25 postgraduates (1.8%); from the perspective of majors, 226 (16.0%) in humanities and social sciences, 450 (31.8%) in economics and management, 670 people (47.3%) in science and engineering, 69 people (4.9%) in sports arts.

Sample 2 has 1415 participants with an average age of 20.07 (Std. deviation =1.295) and is used for confirmatory factor analysis. Among them, in terms of gender, there are 703 boys (49.7%) and 712 girls (50.3%); in terms of grades, there are 608 (43.0%) freshmen, 481 sophomores (34.0%), and 277 juniors (19.6%), 18 seniors (1.3%), and 31 postgraduates (2.2%); from the perspective of majors, 694 (49.0%) students are in humanities and social sciences, 185 (13.1%) students in economics and management, 489 (34.6%) students in science and engineering, and 47 (3.3%) students in sports arts.

In addition, 100 students were pretested before the formal test; four weeks after the formal test, 80 subjects were randomly selected as retest samples, and 80 pairs of valid data were obtained.

Instruments

The MSPSS, one of the most widely used psychological tools for measuring an individual's perceived social support, was developed by Zimet et al.[23] The scale contains a total of 12 items, which are divided into three dimensions: Family, Friends, and Significant Others, with 4 items in each.[22,23] Being authorized by Zimet and G.D, we revised the scale. Using the Chinese-English back-translation method, two psychology professors first translated the scale into Chinese, then asked two English professors to back-translate the scale into English, and then two other psychology professors compared the back-translated English with the original text. A small sample test was conducted on 100 college students first, and students were fully asked about their opinions on the scale, including whether the scale is easy to understand and whether there are ambiguities. After repeated discussion and modification, the items of the Chinese version are finally determined. The research team strive to make each item in the Chinese version faithful to the original text, accurate and easy to understand. The Chinese version does not add or remove any items. Considering that it is difficult for college students to define Significant Others and some students did not understand "special person" very well during the trial test and for Chinese college students, the most common "special person" is their teacher, this study translates the "special person" in the original scale into "special person (such as my teachers)", so the scale includes three dimensions: Family support, Friend support and Significant others (such as teachers) support, with a total of 12 items. The original scale is a Likert 7-level score, but given that the 7-level scoring is not popular for some college students, the revised scale uses a Likert 4-level score, with 1 point for non-conformity, 2 points for unsatisfactory conformity, 3 points for somewhat conformity, and 4 points for conformity. The total score ranges from 12 to 84, with higher total score indicating greater social support. The Cronbach's Alpha coefficient in this measurement is 0.906.

Rosenberg Self-esteem Scale (SES)

The scale was compiled by Rosenberg in 1965, with a total of 10 items, scored on 4 levels, 1 for "strongly agree" and 4 for "strongly disagree"; the higher the score, the higher the level of self-esteem.[40] The Cronbach's Alpha coefficient of this scale in this study was 0.902.

Self-Rating Depression Scale (SDS)

The scale has 20 items and is scored on 4 levels, 1 for no or very little depression, and 4 for depression most or all of the time; the higher the score, the higher the level of depression.[41] The Cronbach's Alpha coefficient of this scale in this study was 0.885.

Self-Rating Anxiety Scale (SAS)

The scale has 20 items and is scored on 4 levels, 1 for no or very little anxiety, and 4 for anxiety most or all of the time; the higher the score, the higher the level of anxiety.[41] The Cronbach's Alpha coefficient of this scale in this study was 0.883.

Statistical Analysis Technique

SPSS24.0 and Lisrel8.80 were used for data analysis in this study. First, item analysis and exploratory factor analysis (EFA) were performed using data from sample 1, and then, confirmatory factor analysis (CFA) was performed using data

from sample 2. Next, we performed a reliability test using the total sample data. Finally, the retest reliability was verified using the data from the retest samples four weeks later.

Result

Item Analysis

Firstly, the items of the scale were analyzed as follows: (1) Item-total correlation. The results show that the correlation between each item of the scale and the total score is between 0.525 and 0.806, all higher than the standard of 0.30, P<0.001, see Table 1 for details. (2) Critical ratio. The highest 27% of the total score of the scale is taken as the high group, and the lowest 27% as the low group, and an independent sample *t*-test is performed. The results show that there is a significant difference between the high and low groups of each item (P<0.001), which indicates that the scale Items are highly differentiated. Therefore, it can be considered that the scale meets the standard of item analysis.

Validity Analysis

Exploratory Factor Analysis

For sample 1 (n=1415), Principal Component Analysis and Varimax with Kaiser Normalization are used to conduct exploratory factor analysis on the 12 items of the scale. As a result, the KMO value is 0.915, and the Bartlett's sphericity test value is 9093.273, P<0.001, indicating that it is suitable for exploratory factor analysis. With reference to the screen plot, three factors with characteristic roots greater than 1 are obtained, and the cumulative variance contribution rate is 69.185%. See Figure 1 and Table 2 for details.

Confirmatory Factor Analysis

Confirmatory factor analysis is performed on sample 2 (n=1415), and the results shows that the fitting indices meet the statistical criteria (see Figure 2 and Table 3 for specific values).

The fitting index of the model (n=1415) is: $\chi 2/df$ is 4.105, GFI is 0.93, NFI is 0.98, IFI is 0.98, CFI is 0.98, RMR is 0.037, RMSEA is 0.079, which shows that the model fits well.

Criterion-Related Validity

The total score of MSPSS and its three factors are positively correlated with self-esteem, with a correlation value of 0.360~0.434, which is significant at the 0.01 level; negatively correlated with depression, with a correlation value of −0.358~-0.436; negatively correlated with anxiety, with a correlation value of −0.247~-0.303, which is significant at the 0.01 level.

Reliability Analysis

The internal consistency reliability test and Spearman-Brown Coefficient test are carried out on the 1415 valid data of sample 1; the retest data of subjects with an interval of 4 weeks are analyzed, and the results are shown in Table 4.

It can be seen from the above table that the internal consistency coefficient of the scale is 0.765~0.906, the Spearman-Brown split-half coefficient is 0.787~0.862, and the test-retest coefficient is 0.837~0.914, indicating that the scale has high reliability.

Discussion

This study takes Chinese college students as subjects to revise the MSPSS. The revised scale structure is consistent with the original author's research.

Table 1 Item-Total Correlation

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
Total	0.724**	0.731**	0.593**	0.674**	0.806**	0.719**	0.736**	0.688**	0.728**	0.773**	0.525**	0.749**

Note: **P<0.01.

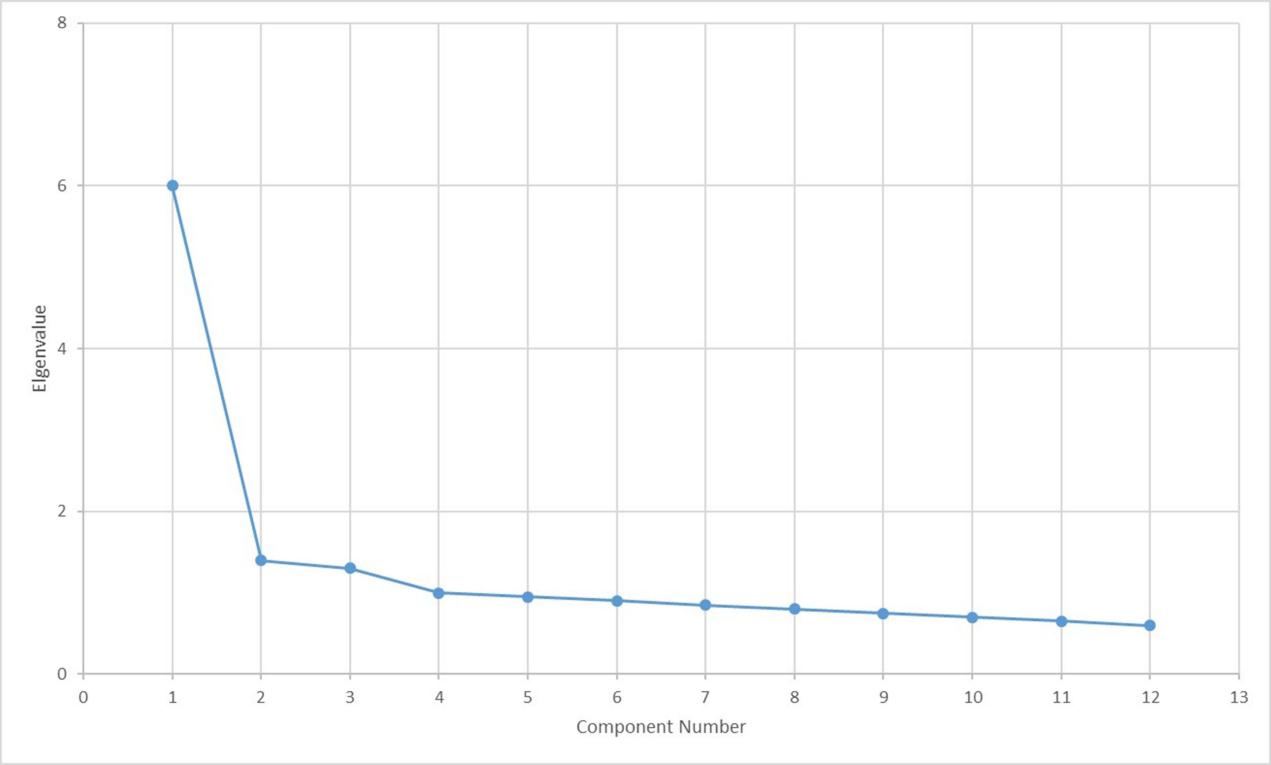

Figure 1 Screen Plot.

Translation and Modification of the Scale

In this study, no item of the original scale is deleted in the revision process. Considering that it is not easy to define Significant Others and in order to make the meaning of the scale clear, understandable and not confused, we translate the "special person" in the original scale into "special person (such as my teachers)", so that the revised scale includes three factors: Family support, Friend support and Significant others (such as teachers) support, with a total of 12 items.

The original scale is a 7-level Likert score, but we found in the pre-test that the 7-level score is slightly cumbersome for college students. Therefore, the more common Likert 4 scores are used in the formal scale, that is, 1 point for non-conformance,

Table 2 Factor Rotation Load Matrix

Item	Factor 1	Factor 2	Factor 3	Conformity
S9	0.791	0.264	0.208	0.738
S7	0.779	0.276	0.212	0.728
S12	0.779	0.280	0.236	0.740
S6	0.767	0.238	0.249	0.707
S1	0.218	0.840	0.159	0.778
S2	0.265	0.837	0.128	0.787
S5	0.326	0.745	0.314	0.759
S10	0.412	0.613	0.309	0.641
S4	0.109	0.288	0.799	0.734
S3	0.201	0.153	0.726	0.591
S8	0.239	0.254	0.716	0.634
S11	0.234	0.036	0.639	0.465
Characteristic roots	6.034	1.241	1.027	
Contribution rate	50.281	10.344	8.560	
Cumulative variance contribution rate	50.281	60.625	69.185	

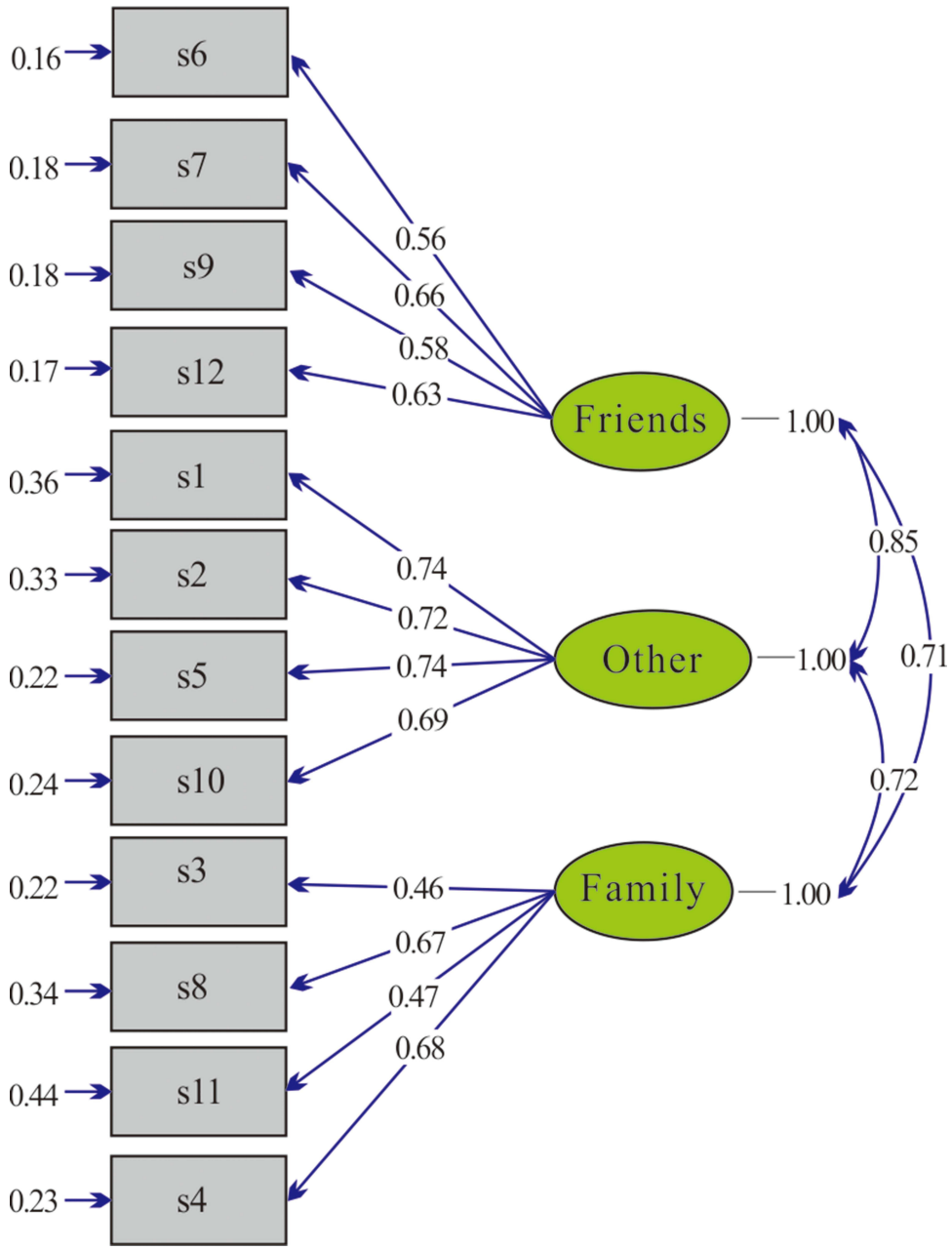

Figure 2 A three-factor CFA model.

2 points for some non-conformance, 3 points for some conformance, and 4 points for conformance. In this way, it is more clear for college students to answer.

The Reliability and Validity of the Scale

In this study, the results of item analysis show that the total correlation between each item of the scale and the total score ranges from 0.525 to 0.806, and the score difference between the high group and the low group on all items is significant.

Table 3 The Model Fit Indices (n=1415)

Fit Indices	χ^2	df	χ^2/df	GFI	NFI	IFI	CFI	RMR	RMSEA
Model value	209.38	51	4.105	0.93	0.98	0.98	0.98	0.037	0.079
Recommended value			<5	>0.9	>0.9	>0.9	>0.9	<0.05	<0.08

Table 4 Reliability Analysis Result

	Internal Consistency Coefficient	Spearman-Brown Coefficient	Test-retest Coefficient
Friends support	0.876**	0.840**	0.877**
Significant others (such as teachers) support	0.875**	0.854**	0.876**
Family support	0.765**	0.787**	0.837**
Total score of social support	0.906**	0.862**	0.914**

Note: **P<0.01.

The cumulative contribution rate of exploratory factor analysis is 69.185%; confirmatory factor analysis shows a good fit of the data. The total score and three dimensions of the scale are positively correlated with self-esteem, and negatively correlated with depression and anxiety. The overall internal consistency coefficient of the scale is 0.911, the split-half coefficient is 0.865, and the test-retest coefficient is 0.914. The above results indicate that the Chinese version of the scale has high reliability and validity.

The Significance of the Scale Revision

This study translated and revised the Chinese version of MSPSS, and verified the reliability and validity of the scale through a large sample size, which is of great significance to the psychology community. On the one hand, this scale provides a scientific measurement tool for research on social support in China, facilitating researchers to understand the social support of Chinese college students, so as to evaluate and analyze it, which can provide support for clinical intervention and prevention. On the other hand, this also provides the possibility for comparison between studies using MSPSS for measurement, and in particular, the revision of the scale provides the possibility for international comparison between studies in China and those in other countries.

Conclusion

The Chinese version of the Multidimensional Scale of Perceived Social Support (MSPSS) includes 3 subscales and 12 items, which has a relatively stable psychological structure. The study shows that the Chinese version of the scale has high reliability and validity, and can be used as an effective tool to evaluate the social support of college students.

Ethics Statement

All procedures performed in studies involving human participants were in accordance with the ethical standards of and approved by the institutional research committee at Shanghai University and Shanghai University of Finance Economics. Informed consent was obtained from all individual participants included in the study. The guidelines outlined in the Declaration of Helsinki were rigorously adhered to throughout the study.

Disclosure

The authors report no conflicts of interest in this work.

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