

Group conversion revision of the Adolescent Gratitude Scale

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Abstract:

Background: currently, China lacks relevant measuring tools of gratitude, and the exploration of localization background is limited. In this study, the existing AGS will be modified to enhance the applicability of different groups. Methods: 195 participants were selected from a Chinese university and the original AGS scale and the revised AGS scale were used for the measurement. Results: through exploratory factor analysis (KOM > 0.8), reliability (alpha = 0.937), and to distinguish the validity check, the scale of the revised item has a good degree of differentiation ($t = 20.401$, $P < 0.05$), the difficulty ($0.2 < P < 0.4$), and normal use standard, after adjusting dimensions: gratitude to the natural, social, and lack of gratitude, gratitude to others. Discussion: some theoretical assumptions were not properly considered in the revision process, but overall, the applicability of the revised scale was strengthened, fully conforming to the original assumptions, and achieving the purpose of broadening the scope of scale users and highlighting the practical value of combining exploration with local background.

Key words: gratitude, teenagers, college students, AGS.

1. Introduction

1.1 Research status and background

As one of the most important virtues of human beings, gratitude, as a highly praised human quality, has always been highly respected by many religions in the world and attached importance to by philosophers and theologians. In terms of concept, Heider(1958) and Weiner(1985) regarded gratitude as an instant emotion produced by people when they receive some valuable gifts or favors. McCullough, Tsang and Emmons et al. (2004) regarded gratitude as a state of mind. McCullough, Tsang and Emmons et al. (2004) see gratitude as a state of mind, to McCullough, Emmons and Tsang represented by quite a number of scholars have the gratitude is regarded as a kind of emotional qualities, knowledge or response is a kind of grace generalization tendency, called Gratitude intention or tendencies (Anming He, 2011).

However, after the birth of modern psychology, the study of gratitude has been ignored, and gratitude has almost become the "forgotten corner" in psychological research (LiyangZhang, XiaohuaHou, 2010).The psychology community has made some progress in the concept, theory and measurement of gratitude.

In addition, A.M.He et al. (2012) proposed a localized three-dimensional structure theory of gratitude based on the definition of gratitude. Secondly, puts forward the proposal of three-dimensional structure theory of gratitude, think gratitude by "object (others, the society and the nature)", "content (state< immediacy the mood> the trait appreciate< persistence emotion >)" and "operation (perception and experience, expression and returns)" three dimensions structure, can be subdivided $3 * 2 * 2 = 12$ kinds of basic type of gratitude.

The 12 basic gratitude types combined by the three-dimensional structural theory model of gratitude can be regarded as a whole or divided into 12 relatively independent parts, which may provide basis and guidance for the specific evaluation and targeted intervention of individual gratitude (as shown in Picture 1).

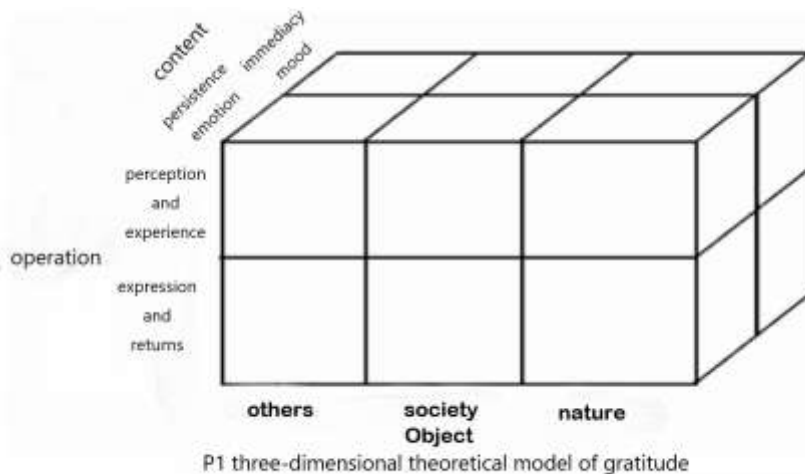
In the measurement of gratitude, most existing measurement tools are specific to trait gratitude, mainly including GQ-6 by McCullough et al. (2002), GRAT by Watkins et al. (2003), As by Adler and Fagley(2005).

In recent years, China has also begun to pay attention to gratitude, but most of the gratitude measurement tools are translation and revision of the Western questionnaires, such as the study of Chen et al. (2009). Or simply prepare questionnaires based on Western theories, such as the study of Yunxian Ma et al. (2004); Zhengfu Shen.et al 's Gratitude quality Scale for college students (2011), wen chao et al.' s Adolescent Gratitude Scale (2010) and AGS (2012b) are among the few scales with obvious Chinese cultural significance.

Western gratitude is more abstract, religious philosophy strong color, the gratitude in China is more specific, rich secular atmosphere; The west focuses on gratitude to god and nature, while the east emphasizes gratitude to people and society. While the west emphasizes gratitude and gratitude, the east emphasizes gratitude and gratitude. The individualism of Gratitude in the west is obvious, while that of gratitude in China is social and collective.

Therefore, the theory and measurement of gratitude, which are suitable for western social culture, are not necessarily suitable for Chinese teenagers. Looking for the idea of gratitude from our social culture, constructing the theory of gratitude and compiling the scale of gratitude may have greater practical significance and application value than directly quoting foreign achievements. (Anming He, 2012)

Figure 1



To sum up, Chinese and western countries have different definitions of the concept of gratitude, and there will be some deviation if western gratitude measurement tools are adopted directly in China. However, the measurement of AGS in gratitude only combines the "operation" and "object" of the three-dimensional model.

There is still space for improvement in the consideration of the "content" of gratitude. Western gratitude scale measurement tools are not fully applicable to the actual situation in China, while Chinese native scale measurement tools are less developed and applicable to a narrow range of people.

Therefore, this study will conduct group conversion revision of the scale, aiming to increase the applicability and broaden the scope of application of the scale on the basis of previous studies, so as to provide experience for subsequent relevant studies.

1.2 Purpose and Hypothesis

In terms of the current research status, previous researches on gratitude mainly focus on its specific content, while ignoring the exploration of college students and their local background. Therefore, the purpose of this questionnaire is to study the characteristics of Chinese college students behind the psychology of gratitude by combining with the three-dimensional theoretical model of gratitude. The experimental hypothesis is as follows:

- (1) the revised questionnaire can be formally put into use, with good results after exploratory factor analysis and reliability and validity analysis.
- (2) the adolescent gratitude scale (AGS) needs to be revised for college students, and the relevant dimensions should be adjusted according to the results.

Based on the above considerations, starting from the perspective of group transformation, this study revised the original AGS questionnaire to a questionnaire more suitable for college students, and revised it on the basis of referring to the "three-dimensional theoretical model of gratitude", the objects and behaviors of college students' gratitude and several literatures.

In order to measure "gratitude" more comprehensively, the connotation of gratitude itself is more precisely explained. More fully explore the psychological components of college students' gratitude, and then develop a gratitude scale suitable for Chinese cultural background; At the same time, this paper discusses whether gratitude is a pure positive psychology and studies the characteristics and demographic differences of college students' gratitude.

2. Methods and procedures

The total number of subjects was 205, and 195 valid data were collected, mainly from Sichuan, Guizhou, Chongqing and other provinces and cities (with a small number of subjects), including 55 males and 150 females, ranging in age from 17 to 27.

2.1 research tools

Questionnaire star (an online questionnaire publishing tool), SPSS tool.

2.2 research methods

In order to test the reliability and validity of the original AGS scale, we retested the original AGS scale before the revision, so as to better guarantee the subsequent revision of the AGS scale.

2.2.1 Preliminary Retest

The first step is to integrate and sort out the original scale and relevant literatures, and to investigate the dimensions, theoretical basis and reliability and validity of the questionnaire. Specific data is as follows: AGS theory of factor analysis to obtain the desired six factors, namely "perception of social grace and experience" (1, 5 items), "expression of natural grace and return" (2, 4 items), "the natural grace of perception and experience" (3, 4 items), "the expression of grace to others and return" (4, 4 items), "grace expression and return to society" (5, 3 items), "perception and experience the grace to others" (6, 3 items).

The explanatory amount of 6 factors difference is 22.99%, 8.39%, 6.99%, 5.29%, 4.97% and 4.78% respectively, and the total explanatory amount is 53.43%.

In the distribution of specific questions, except for items 12, 15 and 22, which are reverse scoring questions, all other questions are scored by normal five-point scoring method (refer to Picture 2 for details).

In terms of reliability and validity, the internal consistency coefficient of the six factors ranged from 0.61 to 0.75, and the internal consistency coefficient of the total scale reached 0.84. The reliability of the six factors and the total scale are all above 0.78, indicating that the scale has good internal consistency and stability on the whole(Figure2 as follows).

Table2 -
The interpretation rate of AGS original scale -

Item number	Item content	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
T8	I am always happy to live in today's society	0.730					
T19	I am very glad to be born in this great nation and country	0.708					
T10	The country and society provide good conditions for my growth	0.687					
T5	School taught me many wonderful things	0.660					
T13	Collective makes my life full of joy and warmth	0.530					
T9	I take good care of public property		0.725				
T11	I from around the little things to do to protect nature		0.709				
T17	I love every tree and grass in nature		0.693				
T23	I am willing to contribute to the greening and beautification of nature		0.541				
T3	I appreciate the beauty of the scenery around me			0.716			
T1	I often indulge in the beautiful nature			0.795			
T14	I feel the most beautiful music is the nature of the music			0.636			
T6	I believe sunshine, air, wind, frost, snow and rain are all gifts from nature			0.539			
T21	I remember the care and devotion of my friends				0.689		
T20	I am always moved by others' care and help				0.689		
T18	I am always grateful to those who care and help me				0.675		
T16	I tried my best to help those friends who had helped me				0.632		
T4	Whenever I get a chance, I will do something good to give back to the society					0.697	
T7	I am enthusiastic about social welfare and often participate in public welfare activities					0.667	
T2	I always repay my teacher for his teachings and love in some way					0.614	
T15	Everything my parents did for me was taken for granted						0.708
T22	I have no need to thank others for their help						0.706
T12	I seldom take the initiative to help others in my daily life						0.615
	Sum of squares	5.288	1.931	1.608	1.217	1.143	1.101
	Contribution rate (%)	22.991	8.394	6.993	5.293	4.969	4.788

2.2.2 Sorting and Modification

In the second step, we set up the questionnaire through questionnaire star (an online questionnaire release software) in accordance with the principle of conciseness and accuracy.

After discussion, the guiding language and arrangement of the original questions were adjusted, and the scoring and presentation methods of the questions were adjusted, so as to better reduce the disadvantages of the online test and enable the subjects to better read and understand the questions and make more effective choices.

2.3 Formal Testing

We conducted a brief analysis of the collected data after the end of the first measurement (see the results below). On the basis of the first paper survey, the second survey was carried out.

2.3.1 Questionnaire Revision

On the basis of the analysis of the first measurement data, we deleted and changed the questions with related problems -- those in the component matrix that conform to two dimensions, but the factor load does not reach the basic interpretation strength and is not highly representative.

After modifying, deleting and retaining all related questions, all existing questions shall be integrated, and then classified and sorted out according to the basis. It is found that some dimensions of the existing scale are deviated from the original dimensions.

We integrated and supplemented the existing dimensions according to the theoretical basis of A.M.He's "three-dimensional scale of gratitude".

On the operational level, gratitude, as an emotional trait, is an individual's immediacy or persistence in perceiving and experiencing, expressing and rewarding others, society or nature. The completed dimensions are: "gratitude to nature and society, gratitude to others, and lack of gratitude."

2.3.2 Implementation Steps

The revision of this scale includes the following steps

1. Prediction test: the questionnaire is distributed on the questionnaire star. After the valid questionnaire is collected, the data of prediction test is analyzed.
2. Formal test: the valid questionnaire is still collected by issuing the questionnaire on the questionnaire star. Subsequently, data analysis was conducted uniformly.
3. Data processing: collected and employed valid data, conducted project analysis and exploratory factor analysis with SPSS20.0 statistical software, completed the re-screening of questions, and formed the final formal scale. After that, the data were collected and analyzed again.

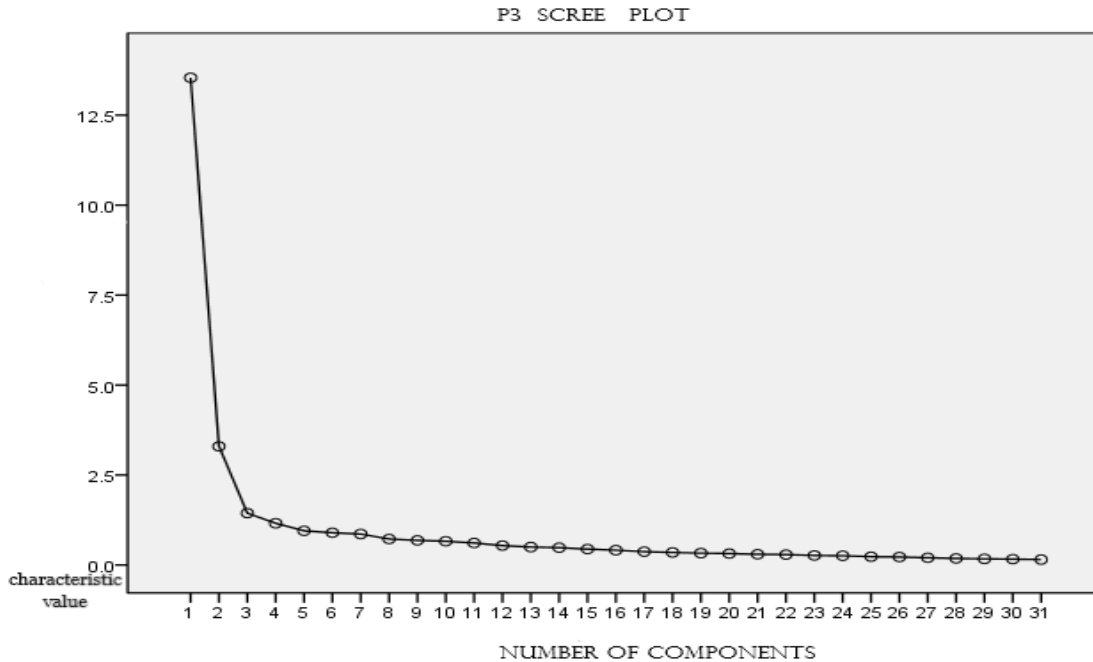
3 The Results

3.1 Revised structure of adolescent gratitude scale (AGS)

An exploratory factor analysis was carried out after 195 subjects (10 were lost in the retest) converted the evaluation of AGS revised preliminary version into standard scores. According to the

lithotripsy map and the percentage of variance explained, four factors should be taken for orthogonal rotation.

Figure 3



According to the relevant deletion and selection principle, when a factor only corresponds to two or less variables, the variable and the factor need to be deleted, so question 31 and the corresponding fourth factor need to be deleted.

After v31 is deleted, a factor analysis is conducted again to obtain the factor load matrix (after rotation) of the second factor analysis, as shown in the following table. According to the analysis results of orthogonal rotation, it can be well concluded that the results of orthogonal rotation need to be sorted out, deleted and changed.

Table 4: Rotation component matrix

Component	1	2	3
V7	.78		
V2	.72		
V13	.69		
V8	.68		
V4	.67		
v14	.67		
v5	.63	.42	
V22	.62	.44	
V11	.62	.48	
V6	.60	.48	
V1	.60		
V3	.58	.49	
V25	.58	.54	
V21		.82	
V20		.78	
V19		.78	
V16		.76	
V9		.68	
V26		.65	
V18	.43	.64	
V30		.64	
V10	.52		
V23	.50		
V17	.56		
V29	.43		.82
V27			.78
V15			.76
V24			.71
V12			.63
V28			.59

3.2 Determination of the structure of the revised AGS

Since each dimension contains multiple items, exploratory factor analysis is carried out for each dimension, and names are given according to the analysis results. Firstly, exploratory factor analysis was carried out for 13 items in dimension one.

Three factors were selected for orthogonal rotation according to the gravel map and the percentage of explained variance, and the items with low load were deleted one by one. According to the results of exploratory factor analysis (the correlation coefficient matrix is too large to be shown directly), questions with a correlation coefficient greater than 0.4 indicate a high correlation. The first 24 questions show a high correlation between local variables and local variables. Questions 24 to 31 show a moderate correlation.

Bartlett sphericity value is 4116.01, significance probability is 0.000, less than 0.05, so factor analysis can be carried out. The KOM value is 0.943, greater than 0.8, which means it is very suitable for factor analysis.

Table 5: KMO and Bartlett tests

The Kaiser- meyer-olkin measure of sampling adequacy		Bartlett's sphericity test		
		The approximate chi-square	df	Sig.
.94		4116.01	465.00	.00

In addition, it can be seen from table 6 that the probability corresponding to the Pearson product moment correlation coefficient of all questions and the Pearson product moment correlation coefficient of the total amount table is significant at the level of 0.01, so it can be concluded that there is a significant correlation between all questions and the total score of the scale.

It indicates that the fitting degree of each item and total table is very good.

Table 6: The correlation

		Total score	V31
Total score	Pearson correlation	1	-.16*
	Significance (bilateral)		.023
	N	195.00	195.00
V31	Pearson correlation	-.16*	1.00
	Significance (bilateral)	.023	
	N	195	195

*. Significant correlation at the 0.05 level (bilateral)

3.3 Determination of the revised dimensions of the adolescent gratitude scale (AGS)

By means of principal component analysis, the total variance of interpretation was extracted into a factor because the eigen value was set to be greater than 1. The questionnaire extracted four factors, which together explained 62.701% of the total variation of the original variable.

Overall, the effect of factor analysis is not good. The factors of the project need to be re-discussed and redetermined.

After deleting or modifying 10 items, dimension 1 is composed of 8 items, dimension 2 is composed of 7 items, and dimension 3 is composed of 6 items. 3.3 the reliability and validity of AGS

3.3.1 Reliability.

The Cronbach's alpha coefficient of the whole scale was 0.937, indicating that the homogeneity (internal consistency) of the scale was very high, which was an ideal level according to the evaluation scale of the alpha coefficient. (see Table 7 below)

The Cronbach's coefficient alpha value of the first part was 0.902, and the Cronbach's coefficient alpha value of the second part was 0.871.

The questionnaire should be of unequal length, so the reliability after Spearman-Brown correction was 0.908. (see Table 8 below)

Table 7

Reliability statistic	
Cronbach's Alpha	.94
Item number	30

Table 8: Reliability statistic

Cronbach's Alpha	Correlation Between Tables		Spearman coefficient of Brown	Guttman Split - Half coefficient	
	Part 2	Item number		Equal length	Unequal length
15 ^a	.09	15 ^b	.83	.91	.91

3.3.2 Validity

Content validity (lack of adequate expert evaluation) and criterion correlation validity (no other criteria other than the questionnaire itself were examined) are not available in this scale. So discriminant validity is used to measure the correlation of dimensions.

Combining the scale and the scores of each dimension scale score calculation, the results showed that: in addition to the natural, social and appreciate the missing dimension, the dimension and the dimension table, total computing the correlation coefficient between all reached significant level ($P < 0.01$), and finally get the dimension and the dimension between the correlation coefficient is less than the dimensions and the correlation coefficient between total score, illustrating the distinction between the revised scale has good validity. See table 2 for details.

Table 9: Correlation of various dimensions and total scores (r)

Items	Total scores	Gratitude to nature and society	Gratitude to others
Gratitude to nature and society	0.83 **		
Gratitude to others	0.86 **	0.74 **	
The lack of gratitude	0.54 **	0.05	0.19 **

Tips: ** P < 0.01

3.3.3 Project differentiation

The total score of the scale was divided into two groups (the top 27% of the total score was the high group) after ranking;

After that, independent sample t test was conducted to investigate whether the difference between the two groups was significant. The results showed that the Levene test of the variance equation obtained $P < 0.05$, rejected the null hypothesis, i.e., variance in homogeneity, and accepted the t test, $P < 0.05$.

The conclusion was that the scores of the high and low groups were significantly different in each question and the total score, i.e., the items in the scale had good degree of differentiation and discrimination.

Table10: Independent-t test

Total score		Equal Variances assumed	Equal variances not assumed
Levene test for variance quations	F	10.72	
	Sig.	0.001	
T test for the mean value equation	t	20.40	19.89
	df	109	77.71
	Sig. (bilateral)	0	0
	The mean difference	36.53	36.53
	Standard error	1.80	1.84

3.3.4 Difficulty of the project

The absolute value of the difference between the average scores of the high group and the low group in each item is divided by 4 (the maximum span of the scores of the subjects in each item), which is the discrimination index (D) of this item, which reflects the ability of this item to distinguish different subjects.

Table 11: Index of discrimination

	M high group	M low group	Index of discrimination
v1	4.34	3.21	0.28
v2	4.26	3.09	0.29
v3	4.62	3.36	0.32
v4	4.48	3.26	0.31
v5	4.67	3.26	0.35
v6	4.76	3.30	0.37
v7	4.26	2.89	0.34
v8	4.62	3.23	0.35
v9	4.83	3.87	0.24
v10	4.83	3.63	0.30
v11	4.69	3.4	0.32
v12	4.28	3.26	0.26
v13	4.64	3.17	0.37
v14	4.63	3.25	0.35
v15	4.31	3.66	0.16
v16	4.84	3.60	0.31
v17	4.6	3.30	0.33
v18	4.9	3.64	0.32
v19	4.86	3.62	0.31
v20	4.88	3.74	0.29
v21	4.93	3.68	0.31
v22	4.69	3.26	0.36
v23	4.59	3.34	0.31
v24	4.28	3.53	0.19
v25	4.81	3.60	0.30
v26	4.73	3.43	0.33
v27	4.34	3.43	0.23
v28	3.40	2.87	0.13
v29	4.41	3.15	0.32
v30	4.72	3.62	0.28

4. Discuss

4.1 Deficiencies

In this study, AGS project was re-measured and revised according to teenagers' understanding ability and expression habits. After the evaluation of 205 subjects, it was found that the gratitude of college students was composed of three dimensions, which enriched the application scope of the scale group and basically reached the standard used.

However, it is quite different from the previous dimension structure of the original scale, so we have to think again about the places where we failed to reach the standard and many shortcomings in the whole measurement process. Compared with the previous understanding, we have deepened the theoretical basis of the original scale, the consideration of dimension division and the reference of the existing work.

4.2 Prospects

What's more, the data obtained in this revision work are relatively ideal, and the related project analysis, variance interpretation rate and reliability and validity are good, which can be put into use well. For the revision of existing scale, strengthen the we are familiar with the operation of scaling process and cognitive depth, especially the theoretical assumptions, to make perfect when I was in contact with us for more details, therefore, in reference to "gratitude three-dimensional theory model" and its relevant evaluation gratitude psychological/qualities of tools, on the basis of theories and ideas, should strengthen the research hypothesis and we want to achieve the purpose of the above, the purpose and implementation process of execution.

At the same time, based on the background of localization, this study not only promotes the applicability of the scale, but also widens the scope of use of the scale based on the actual situation. The revised experience is provided for the implementation of AGS, a localized gratitude measurement tool, among different groups. If there is an opportunity, the purpose and motivation of follow-up work will be more accurate and a lot of preliminary work will be reduced.

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