Preliminary construction and validation of a questionnaire on adolescents' personal growth proactivity

Miao Duoduo[1,a], Leon Meyer[2,b,*],

[1]Fujian Normal University, No. 18, Wu longjiang Middle Road, Shangjie Town, Minhou County, Fuzhou City, Fujian Province, 350117, China.
[2]Cornell University, Ithaca, New York 14853, USA
a.duoduo_6358miao@sina.com, b.meyer_950368david@gmail.com
*Corresponding Author

Abstract: The questionnaire was administered in middle schools and data from 944 valid participants were obtained, randomly divided into two parts. Sample one (N=472) was used for exploratory factor analysis, and sample two (N=472) was used for confirmatory factor analysis. The results indicated that the Adolescent Personal Growth Proactivity Questionnaire consists of 24 items, which are categorized into five factors: Growth Internality, Growth Autonomy, Growth Self-Determination, Growth Seeking, and Growth Externality. The questionnaire demonstrated good reliability and validity.

Keywords: Adolescents, Personal Growth Initiative, Factor Analysis, Reliability, Validity

1. Introduction

The rise of positive psychology has provided us with a fresh perspective to explore and understand the positive psychological qualities of humans. Seligman and others' paper "Positive Psychology: An Introduction," published in 2000[1], marks the inception of this research field. Positive psychology uses scientific research methods to discuss happiness, strengths, hope, etc., advocates a positive orientation in psychology, and focuses on the positive psychological qualities, health, happiness, and harmonious development of humans.[2]

"Personal Growth Initiative" (PGI), as a new concept from the perspective of positive psychology, has gradually entered the field of vision of researchers and attracted widespread attention from domestic and international scholars. Among them, the Personal Growth Initiative theory proposed by Robitschek and others has certain representativeness, suggesting that Personal Growth Initiative is the tendency for individuals to consciously improve and perfect themselves. This theory has two core contents: one is that Personal Growth Initiative is a purposeful self-change, [3,4] and the other is that Personal Growth Initiative essentially contains some skills that can be transferred across various fields of life growth, and these skills can be transferred because the process of personal growth is similar to the process of human development.[5] The Personal Growth Initiative questionnaire can be used to measure the level of Personal Growth Initiative. Although the initial questionnaire may contain multiple components, such as cognitive and behavioral components, it is only a single-dimensional questionnaire with 9 items.[3]

Later, Robitschek and others integrated cognitive and behavioral components into the new version of the Personal Growth Initiative questionnaire (Personal Growth Initiative Scale-II, PGIS-II), making up for the disadvantage of the original questionnaire's single dimension. The PGIS-III consists of four dimensions: readiness for change, planfulness, using resources, and intentional behavior [6], where readiness for change and planfulness constitute the cognitive component of the Personal Growth Initiative theory, and using resources and intentional behavior constitute the behavioral component. At the same time, the compilation process of PGIS-I mainly used American college students and other adults as sample objects, and caution should be exercised when introducing it to Chinese adolescent samples. In addition, the concept and structure of Personal Growth Initiative still need further discussion.[7]

Based on this, this study will preliminarily compile and test the "Adolescent's Personal Growth Initiative Scale (APGIS)" suitable for Chinese samples based on the research of Robitschek and others, providing a scientific tool for the study of adolescent personal growth.

2. Participants and methods

2.1. Research participants

In a certain province, middle schools were randomly selected, and questionnaires were distributed to students from the first year of junior high school to the second year of senior high school, totaling 1020 copies, with 980 copies returned. During the data entry process, invalid questionnaires and those with missing values were excluded, leaving 944 valid questionnaires for the final analysis. Among them, there were 454 males, accounting for 48.1% of the total number of participants, and 490 females, accounting for 51.9% of the total number of participants; the number of participants from the first year of junior high school to the second year of senior high school were 190, 185, 136, 231, and 202, respectively; the average age of the participants was 14.87±1.42 years old. Additionally, to assess the test-retest reliability of the questionnaire, a class was randomly selected from the research subjects for retesting after a 2-week interval.

2.2. Preliminary development of the questionnaire

The items of the questionnaire were derived from several sources: First, items were developed based on the theoretical discussions of Robitschek and colleagues. Robitschek's theory of Personal Growth Initiative (PGI) suggests that personal growth includes cognitive and behavioral components. The cognitive component refers to the awareness of one's growth needs, goals, and the methods to be adopted during the personal growth process. For example, "I know what kind of goals I need to set to guide my growth" and "I understand that having good goals is very beneficial to my growth." The behavioral component refers to the actions taken during the personal growth process that are conducive to one's development. For example, "In my learning process, I intentionally change bad habits" and "Sometimes I read books to learn about the growth characteristics of my peers."

Second, some items were obtained by translating and revising the Personal Growth Initiative Scale-II (PGIS-II). For example, "In my growth process, I am good at utilizing various resources" and "I am clear about when I should make changes in myself."

Third, some items were obtained by surveying adolescents' views on personal growth. For example, "I don't like to follow the routine in doing things" and "I feel that only by making an effort to change can my life be meaningful."

Fourth, this article believes that the theory of personal growth initiative lacks motivational components, that is, internal and external motivational factors can be included in the framework of the personal growth initiative theory, and some items were developed based on this. For example, "I always adhere to my ideals and strive to achieve them" "I am very eager about my future learning and life" "I will encourage or blame myself based on the realization of goals."

Based on the above methods of obtaining items, a preliminary questionnaire with 35 questions was developed. Four graduate students majoring in psychology and education were invited to analyze and discuss these items in relation to the purpose of this study. They removed five items that were unrelated to the study and conducted a semantic analysis of the remaining 30 items. They integrated items with similar meanings, modified words that might cause ambiguity, and tried to make the items concise, easy to understand, and clearly stated. Finally, an initial questionnaire with 28 items for the Adolescent Personal Growth Initiative (APGIS) was formed. The questionnaire uses a 6-point Likert scale, with 1-6 representing "very disagree" to "very agree."

2.3. Criterion-related tools

2.3.1. Children's hope scale

Zhao Bi Hua and colleagues' Children's Hope Scale consists of 6 items, scored on a 6-point Likert scale.[8] The odd-numbered items belong to the agency thinking subscale, while the even-numbered items belong to the pathway thinking subscale. The total score of the Children's Hope Scale is obtained by adding the scores of the 6 items, the agency thinking subscale total score is obtained by adding the scores of the odd-numbered items, and the pathway thinking subscale total score is obtained by adding the scores of the even-numbered items. In this study, the alpha coefficient of this scale is 0.750.

2.3.2. Core self-evaluations scale

Ren Zhihong and colleagues' Core Self-Evaluation Scale, consisting of 8 items, employs a 5-point Likert scoring system.[9] Items with positive descriptions are scored as positive items, while those with negative descriptions are reverse-scored. The total score of the Core Self-Evaluation Scale is obtained by summing the scores of the 8 items. The total score for the positive thinking subscale is obtained by summing the scores of the odd-numbered items, and the total score for the path thinking subscale is obtained by summing the scores of the even-numbered items. In this study, the scale's alpha coefficient is 0.779.

2.4. Data entry and statistical methods

Data was entered using Epi Data 3.1, and SPSS 19 was used for correlation analysis, exploratory factor analysis, reliability analysis, and validity analysis. Amos 17 was employed for confirmatory factor analysis. The 944 valid questionnaires were randomly divided into two halves; one half (N=472) served as Sample One for exploratory factor analysis, and the other half (N=472) served as Sample Two for confirmatory factor analysis.

3. Results

3.1. Item analysis

The correlation coefficient between the item and the total score was used as the discrimination indicator for the items. It was found that the correlation coefficients of all items with the total score of the questionnaire ranged from 0.279 to 0.658, with p-values all less than 0.01. Therefore, no items were deleted at this stage.

3.2. Validity

3.2.1. Exploratory factor analysis

Exploratory factor analysis was conducted on Sample One, with KMO=0.926 and χ^2=3975.684, p<0.001, indicating that the items were suitable for exploratory factor analysis. The maximum variance method was used for factor rotation, and the principal component method was used to extract factors. The exploratory factor analysis revealed that six factors could be extracted with an eigenvalue greater than 1, accounting for a cumulative variance of 51.88%.

Considering that some items might have cross-loadings or low loadings, items could be removed based on the following criteria: (1) factor loadings less than 0.4, (2) items with cross-loadings on two or more factors where the difference in loadings is within 0.05. As a result, four items were deleted in total. Specifically, Item 5 (factor loading less than 0.4), Item 2 (cross-loading with a difference within 0.05), Item 7 (factor loading less than 0.4), and Item 28 (cross-loading with a difference within 0.05) were removed, leaving 24 items. These 24 items were distributed across five factors with reasonable loadings, clear factor structure, eigenvalues of 6.975, 1.480, 1.309, 1.181, and 1.118, and a cumulative variance of 50.26%.

Based on the meaning of the items, attempts were made to name the factors as follows: Growth Internality, which includes 5 items and mainly refers to the internal motivation that urges oneself to grow; Growth Autonomy, which includes 5 items and mainly refers to the ability to decide on one's actions or

use resources; Growth Self-Regulation, which includes 7 items and mainly refers to the proactive planning that leads one's growth; Growth Seeking, which includes 4 items and mainly refers to seeking help from others or self-help during the growth process; and Growth Externality, which includes 3 items and mainly refers to external factors influencing self-growth. The factors each item belongs to and their factor loadings are shown in Table 1.

Table 1: The Five Factors and Loadings of the Adolescent Personal Growth Initiative Questionnaire

Growth Internality		Growth Self-Determination		Growth Autonomy		Growth Seeking		Growth Externality	
project	load	project	load	project	load	project	load	project	load
pgi25	0.681	pgi4	0.705	pgi23	0.689	pgil7	0.716	pgil1	0.665
pgi18	0.645	pgi12	0.586	pgi22	0.589	pgi20	0.682	pgi10	0.585
pgi26	0.568	pgi3	0.584	pgi24	0.512	pgi6	0.628	pgi21	0.488
pgi19	0.567	pgi8	0.571	pgi15	0.510	pgi14	0.548		
pgi13	0.560	pgi16	0.493	pgi27	0.506				
				pgi9	0.477				
				pgil	0.469				

3.2.2. Criterion-related validity

Using the Children's Hope Scale and the Core Self-Evaluations Scale as criteria, the correlations between the five factors and the total scores of the questionnaire and the total scores of the Children's Hope Scale and the Core Self-Evaluations Scale were calculated. The results are shown in Table 2.

Table 2: Correlation Coefficients between the Total Score and Five Factors of the Personal Growth Initiative Questionnaire and the Criterion

	Total Score of Questionnaire	Growth Internality	Growth Self-Determination	Growth Autonomy	Growth Seeking	Growth Externality
Agency Thinking	0.606***	0.460***	0.544***	0.532***	0.426***	0.290***
Agency Thinking	0.483***	0.359***	0.435***	0.418***	0.331***	0.263***
Pathway Thinking	0.585***	0.450***	0.524***	0.518***	0.418***	0.249***
Core Self-Evaluation	0.254***	0.172***	0.208***	0.257***	0.212***	0.067***

3.2.3. Reliability

Internal Consistency Reliability: The internal consistency reliability for the entire questionnaire and the five factors (Growth Internality, Growth Self-Determination, Growth Autonomy, Growth Seeking, Growth Externality) are 0.886, 0.736, 0.732, 0.750, 0.680, and 0.531, respectively. The correlation coefficients between each pair of the five factors range from 0.363 to 0.608, and the correlation coefficients between the five factors and the total score of the questionnaire range from 0.638 to 0.830.

Split-Half Reliability: The split-half reliability for the entire questionnaire is 0.858.

Test-Retest Reliability: The test-retest reliability for the entire questionnaire and the five factors (Growth Internality, Growth Self-Determination, Growth Autonomy, Growth Seeking, Growth Externality) after a two-week interval (N=55) are 0.873, 0.792, 0.774, 0.711, 0.690, and 0.635, respectively.

3.2.4. Confirmatory factor analysis

Sample Two (N=472) was used for confirmatory factor analysis. Amos 17 was employed to conduct the confirmatory factor analysis on 24 items using the maximum likelihood estimation method to establish a multi-factor oblique model. The model reached a state of convergence after 10 iterations, and the results indicated that the model had good fit indices: χ^2=542.141, df=243, χ^2/df=2.231, RMR=0.092, GFI=0.911,

AGFI=0.890, IFI=0.901, CFI=0.900, RMSEA=0.051 (90% confidence interval for RMSEA is 0.045-0.057).

4. Discussion

In the development process of the Adolescent Personal Growth Initiative Scale, this study analyzed literature on personal growth initiative, based on Robitschek and colleagues' theory of personal growth initiative, referred to the items of PGIS-III, and through investigating adolescents' views on personal growth initiative, combined with the researchers' contemplation of the theory, an initial questionnaire was formulated. Exploratory factor analysis and confirmatory factor analysis were employed as statistical methods to obtain a 24-item questionnaire with five factors. The factors were named "Growth Internality," "Growth Self-Determination," "Growth Autonomy," "Growth Seeking," and "Growth Externality" based on the meaning of the items within each factor. Among them, Growth Self-Determination and Growth Autonomy are the cognitive components of personal growth, Growth Seeking is the behavioral component of personal growth, Growth Internality is the internal motivational factor for personal growth, and Growth Externality is the external motivational factor that promotes personal growth, which aligns with theoretical expectations.

The four-factor model of Robitschek and colleagues' PGI-II has been tested in samples from other countries with varying results. A study conducted in India with 639 college students indicated that the reliability of the original questionnaire's four factors was not very satisfactory; exploratory factor analysis could only extract two meaningful factors, comprising 12 items.[10] Additionally, a study using 927 Chinese college students as subjects demonstrated that the confirmatory factor analysis results supported the original four-factor model of the questionnaire; reliability analysis showed that the four factors had desirable reliability indicators.[11] The Japanese version of PGIS-III, validated by 204 subjects, confirmed that the four-factor model's indicators were within an acceptable range; meanwhile, the reliability coefficients ranged from 0.67 to 0.84[12], indicating good psychometric indicators.

The "Adolescent Personal Growth Initiative Scale" developed in this study has acceptable internal consistency reliability and test-retest reliability for both the entire questionnaire and the five factors; the results of the confirmatory factor analysis supported the five-factor model. Moreover, current research on personal growth initiative typically uses samples composed of normal subjects (such as normal college students, adults, etc.), who have higher personal growth motivation and higher questionnaire scores. There is a lack of research on abnormal subjects (such as those with anxiety or depression), hence the need to expand the sample size and use different types of subjects to further investigate the structure of personal growth initiative.

5. Conclusion

This study conducted a preliminary development and validation of a questionnaire on adolescents' personal growth initiative. By administering the questionnaire in middle schools across four provinces, data from 944 valid participants were collected and randomly divided into two parts: Sample One for exploratory factor analysis and Sample Two for confirmatory factor analysis. The results indicated that the Adolescent Personal Growth Initiative Questionnaire consists of 24 items that can be attributed to five factors: Growth Internality, Growth Self-Determination, Growth Autonomy, Growth Seeking, and Growth Externality. The questionnaire demonstrated good reliability and validity.

From the perspective of positive psychology, personal growth initiative is considered the tendency for individuals to consciously improve and perfect themselves. This study, based on the theory of Robitschek and others, referred to the PGIS-II questionnaire, and combined with surveys of Chinese adolescents, developed a questionnaire suitable for Chinese participants. During the research process, statistical methods such as exploratory factor analysis and confirmatory factor analysis were used to ultimately determine the items and factor structure of the questionnaire.

Additionally, this study found that the internal consistency reliability and test-retest reliability of the Adolescent Personal Growth Initiative Questionnaire met the requirements of psychometrics, and the confirmatory factor analysis also supported the five-factor model. Nevertheless, current research samples

are mainly composed of normal subjects, and future studies need to expand the sample size and use different types of subjects to conduct a more in-depth exploration of the structure of personal growth initiative, in order to enhance the universality and applicability of the questionnaire. Overall, this study provides a scientific tool for studying adolescent personal growth, which is of great significance for understanding and promoting the positive psychological qualities of adolescents.

6. References

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