

Revision of Urban Well-being Index Questionnaire

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【Abstract】 Objective: The present study was to revise the Urban Well-being Index Questionnaire(UWBIQ) and evaluate its validity and reliability in Chinese citizens. **Methods:** A Chinese version of the Revised UWBIQ(UWBIQ-R) was administered to a large sample of Chinese citizens aged 18 to 80(n=2155). **Results:** Exploratory factor analysis of the UWBIQ-R yielded seven distinct dimensions comprising a total of 33 items(one general well-being dimension and six domain-specific well-being dimensions). Confirmatory factor analyses subsequently replicated this factor structure. UWBIQ-R score were significantly and positively correlated with the scores from the Satisfaction with Life Scale and Rosenberg's Self-esteem Scale. The correlation between the UWBIQ-R and Rosenberg's Self-esteem Scale scores was significantly positive with small coefficients. The Cronbach's α coefficient for the total scale was 0.923, and the α coefficients for the dimensions ranged from 0.715 to 0.859. **Conclusion:** The results of this study provide preliminary evidence that the UWBIQ-R can be used to measure multiple dimensions of the well-being of Chinese citizens.

【Key words】 Reliability; Validity; Chinese citizens; Multidimensional Index of Well-being; Psychometrics

中图分类号: R395.1

DOI: 10.16128/j.cnki.1005-3611.2017.06.001

城市幸福指数问卷的修订

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【摘要】 目的:修订城市幸福指数问卷(Urban Well-being Index Questionnaire, UWBIQ), 考查其在中国城市公民群体中的信效度。**方法:**采用修订的城市幸福指数问卷(中文版)在中国多个城市对 18-80 岁的公民进行测试, 获得有效数据 2155 份。**结果:**探索性因素分析的结果显示, 修订的城市幸福指数问卷包含 33 个题目(总体幸福指数包含一个维度, 领域幸福指数包含 6 个维度)。验证性因素分析的结果印证了探索性因素分析的结果。皮尔逊积差相关分析显示, 修订的城市幸福指数问卷分别与生活满意度量表、繁盛人生量表呈中等强度的正相关, 与罗森伯格自尊量表呈弱的正相关。修订的城市幸福指数问卷总的内部一致性系数为 0.923, 各维度的内部一致性系数在 0.715~0.859 之间。**结论:**修订的城市幸福指数问卷可被用于测量中国城市公民的幸福感受。

【关键词】 信度; 效度; 中国公民; 幸福指数; 心理测量学

Well-being, as one of the most important life goals for humankind, is closely associated with individuals' mental health^[1] and physical health^[2] and forms a vital foundation for social harmony^[3]. Given its potential benefits for individuals and society, there is a need to elucidate the central facets of well-being that correspond to perceptions of the world(e.g., political and eco-

nomic conditions, the physical environment, social and cultural environments) as well as our personal experiences(i.e., physical and mental health). Hence, the development of a multidimensional and psychometrically sound instrument for measuring well-being would be useful in fostering the assessment of various aspects of our lives rather than focusing narrowly on only certain dimensions, such as material wealth or material needs.

Given the versatility and complexity of the construct, consensus regarding the definition of well-being has not yet been reached. The composition of subjec-

【项目基金】 本研究得到国家社会科学基金一般项目(12XSH018), 重庆市教委人文社会科学一般项目(14SKM10)和河南省教育厅高校重点联合项目(16A190005)的资助
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tive well-being (SWB, one's cognitive and emotional self-evaluation), however, has been widely accepted in the literature^[4-6]. Thus, the concept of SWB is characterized by more pleasant experience, less negative emotion, and greater life satisfaction^[5].

Furthermore, in recent decades, numerous self-rating scales^[7-13] have been developed to assess SWB, and these measurements can be summarized into two categories. One type of measure typically captures aspects of SWB within a single dimension and focuses on general SWB without considering domain-specific SWB. For example, the Satisfaction with Life Scale (SWLS)^[11], the Flourishing Scale (FS)^[12], and the Subjective Happiness Scale (SHS)^[14] are single-dimension instruments. By contrast, multidimensional measurement focuses on domain-specific SWB without considering general SWB; these measures include the Revised Subjective Well-being Scales for Chinese Citizens (SWBS-CC)^[15] and the measurement of SWB in Taiwan^[13]. The former measure includes 10 dimensions (i.e., interpersonal adaptation, psychological health, physical health, psychological balance, objective value, family atmosphere, social confidence, personal development, satisfaction, and self-acceptance), and the latter one includes 3 dimensions (i.e., health-related, prosperity-related, and social-related well-being). Previous studies have tended to focus on either general or domain-specific SWB but not both simultaneously.

Moreover, numerous studies have demonstrated both differences and similarities in SWB between Chinese and Westerners^[16-18]. For example, life satisfaction may involve not only an evaluation of one's own well-being but also an assessment of the world outside the self^[19]. As researchers^[13, 20] have noted, Confucianism, representing the core value system in traditional Chinese culture, emphasizes that an individual is responsible for the continuation of his/her family lineage rather than focusing on individual well-being. Thus, individuals in China tend to be more concerned about the well-being of family and of society, whereas Westerners are more concerned about individual well-being. In addition, researchers^[21] have suggested that the association between well-being and interpersonal relationships is stronger among Easterners than among Westerners. Consequently, measurements developed with Western

samples may have deficiencies in assessing well-being in Asian countries. Hence, developing a more culturally valid measure of well-being for Chinese citizens is important.

One such measure is the Urban Well-being Index Questionnaire (UWBIQ), which has been significant in the culture-specific research on well-being in Eastern culture. The UWBIQ^[22] was designed by Liu, Li, and Huang (2012), and containing one general well-being dimension (4 items) and six domain-specific dimensions (28 items), enabling the instrument to capture the versatility and complexity of well-being in a more comprehensive manner. The six domain-specific dimensions include satisfaction with political life (6 items), satisfaction with interpersonal relationships (5 items), satisfaction with economic life (4 items), satisfaction with one's environment (5 items), satisfaction with health (4 items), and satisfaction with cultural life (4 items). Although the UWBIQ has greatly improved the assessment of well-being in Eastern culture, some issues are worthy of further study, and some deficiencies must be addressed. For instance, the internal consistency coefficients of the four dimensions (satisfaction with cultural life, satisfaction with interpersonal relationships, satisfaction with health, and satisfaction with one's environment) have been less than ideal. In addition, both convergent validity and discriminant validity require further examination. As a result, this study aimed to improve the psychometric properties of the UWBIQ by modifying some old items and adding new items. Furthermore, to develop a more effective measurement of the multi-faceted and complicated construct of well-being, the Satisfaction with Life Scale and Flourishing Scale were used to examine the convergent validity of the UWBIQ based on the concept that individuals with a greater sense of well-being are more satisfied with their lives. Similarly, the Rosenberg's Self-esteem Scale was used to test discriminant validity because although self-esteem may be associated with well-being, the correlation between self-esteem and well-being in a collectivist culture tends to be low^[21].

1 Participants and Method

1.1 Participants

The study participants included 2509 Chinese

mainland citizens sampled from communities in Changchun, Jilin, Zhengzhou, Shangqiu, Taiyuan, Datong, Xi'an, Hangzhou, Chongqing, Chengdu, Neijiang, Guiyang, Guilin, and Guangzhou. Cities from the eastern, western, northern and southern parts of China were included. Each participant completed an informed consent form before responding to the research scales. Data were collected by the corresponding author's postgraduate students from the aforementioned cities. Ultimately, 2155 participants(919 males and 1236 females) ranging in age from 18 to 80 years($M=38.90$, $SD=8.93$) completed the study protocol. According to the 2010 Chinese census, 91.51% of the population were Han, and the remaining 8.49% of the population were from 55 ethnic minorities: Zhuang(2.6%), Man(2.5%), Hui(1.9%), Menggu(0.9%), Chaoxian(0.5%), Miao(0.3%), Tujia(0.1%), and Zang(0.1%)^[22]. Table 1 contains the distributions of the main sociodemographic variables.

Table 1 Socio-demographic variables of the participants

Variable	Value	N	%
Gender	Male	919	
	Female	1236	
Education	≤6 years(Primary school)	70	3.25
	6 to 9 years(Junior high school)	366	16.98
	9 to 12 years(Senior high school)	505	23.44
	>12 years(College/university)	1214	56.33
Family status	Married/living together	1855	86.08
	Single	188	8.72
	Divorced	90	4.18
	Widowed	22	1.02
Employment status	Employed	1217	56.47
	Retired	154	7.15
	Unemployed/student	784	36.38
Self-reported physical health	Good	1118	51.88
	Normal	934	43.34
	Bad	103	4.78

1.2 Measurements

The UWBIQ-R was developed based on the UWBIQ, a 32-item self-report questionnaire assessing different aspects of well-being for Chinese citizens. To improve the psychometrics of the UWBIQ, several items were deleted, and new items were added because either the reliability or validity of these four dimensions was unsatisfactory. Two criteria were used to de-

termine which items to revise: (1) item loadings were less than 0.40 and (2) internal reliabilities were less than 0.70. Beginning with these criteria, we devised the following revisions: (1) For the dimension of satisfaction with interpersonal relationships, one item was deleted(i.e., "I have at least one friend"), and two items(i.e., "I am satisfied with my interpersonal relationships" and "I feel very close with the people around me") were added. (2) For satisfaction with health, two items were added(i.e., "I have good health" and "I am satisfied with my health condition"). (3) For satisfaction with one's environment, two items were added(i.e., "I prefer our environment rather than other places" and "Our public surroundings are good, which makes me feel comfortable"). (4) For satisfaction with economic life, one item was added(i.e., "I am satisfied with my income"). (5) For satisfaction with cultural life, one item was deleted(i.e., "In my spare time, I can find something interesting to do"), and one item was added(i.e., "I am satisfied with my cultural"). The subscales of general well-being(i.e., "Generally speaking, I am satisfied with my life at present"; "I think my life is better than others' lives"; "I live a happier life now than in the past"; and "I think life is meaningful") and satisfaction with political life did not change, as the reliability and validity of these two dimensions were good. Thus, the initial UWBIQ-R consisted of 40 items, including 4 items of the general well-being subscale(GW), 6 items for satisfaction with political life, 6 items for satisfaction with interpersonal relationships, 7 items for satisfaction with one's environment, 7 items for satisfaction with health, 5 items for satisfaction with economic life, and 5 items for satisfaction with cultural life. The participants rated each item using a 5-point Likert scale ranging from 1(strongly disagree) to 5(strongly agree), with higher scores indicating greater well-being. As the instrument revision primarily targeted the domain-specific well-being subscale, the psychometric test was largely used for this part as well.

The Satisfaction with Life Scale^[11] is one of the most commonly used well-being measures worldwide to assess the cognitive component of SWB^[23]. On this scale, the participants reported the degree to which they agreed with each of the 5 items(e.g., "In most

ways, my life is close to my ideal”) on a scale from 1 (strongly disagree) to 7(strongly agree).

The Flourishing Scale^[12] is an 8-item measure of the participants' self-reported success in various important areas(i.e., relationships, self-esteem, purpose, and optimism). The scale asks participants to rate the extent of their agreement with each item on a scale from 1(strongly disagree) to 7(strongly agree) and yields a single psychological well-being score.

The Rosenberg's Self-esteem Scale^[24] is a well-validated measure for assessing one's own global self-regard. The participants were asked to complete the scale according to how they typically regarded their global self-evaluation, and the provided answers on a scale from 1(strongly disagree) to 4(strongly agree).

1.3 Statistical Analysis

The Epidata3.0 software was used for data inputting. The SPSS 18.0 software was used for data cleaning, item analysis, exploratory factor analysis(EFA), and reliability analysis. Finally, confirmatory factor analysis(CFA) was conducted using the AMOS 7.0 software.

The 2155 questionnaires collected were divided into two groups, being based on the codes of the participants. The odd-numbered group($n=1077$) was used for the EFA, and the even-numbered group($n=1078$) was used for the CFA.

2 Results

2.1 Item analysis

The higher the correlation coefficient between an item and the scale's total score, the more discriminant the item will be. Therefore, based on the principle that the correlation between an item and the total score should be no less than 0.3 and that the relationship should be statistically significant^[25, 26], two items were deleted, and 33 items were retained in the domain-specific well-being subscales.

2.2 Construct validity

Before the EFA was performed, we computed the Kaiser-Meyer-Olkin statistic and used Bartlett's test of Sphericity. The results($KMO=0.926$, Bartlett's test, $P<0.001$) indicated that the data are suitable for EFA^[27]. The factors were extracted by principal component

analysis with varimax rotation, and the factor loadings and the score for the common factors were then calculated. The following criteria were used to assess the adequacy of the factors extracted: (1)eigenvalues greater than 1.0, (2)the proportion of variance explained, (3)examination of the scree plot, (4)item loadings greater than 0.40 for only one factor and less than 0.30 for all other factors, and (5)at least four items per factor. The results demonstrated that the UWBIQ-R had the same factor structure as the UWBIQ. Specifically, the UWBIQ-R contained 29 items with 6 factors(Table 2). The results indicated that 56.973% of the total variance could be explained by the 6 factors.

To examine the relationships between factors, Pearson coefficients were calculated between the mean scores of the dimensions and the total score for the sample($n=2055$) (Table 3). The results showed that the Pearson coefficients between dimensions ranged from 0.334 to 0.610($P<0.01$), while the Pearson coefficients between the dimensions and the total score ranged from 0.630 to 0.795($P<0.01$).

A CFA was then conducted to test the plausible factor structure of the UWBIQ-R. Six latent variables and 29 observed variables were established based on the EFA results. The main fit indices of the model were the following: $\chi^2/df=4.816$, GFI=0.934, IFI=0.985, NFI=0.981, CFI=0.985, TLI=0.981, and RMSEA=0.060. The results indicated a good fit for our model^[28, 29].

2.3 Convergent validity

We assessed convergent validity by calculating the Pearson coefficients between the total UWBIQ-R score and the total scores for the Satisfaction with Life Scale and the Flourishing Scale. The results indicated that the total UWBIQ-R score was significantly ($P<0.01$) and positively correlated with the total scores for the Satisfaction with Life Scale($r=0.461$, $P<0.01$) and the Flourishing Scale($r=0.520$, $P<0.01$).

2.4 Discriminant validity

We examined discriminant validity by calculating the Pearson coefficients between the total UWBIQ-R score and the total Rosenberg's Self-esteem Scale score. The results revealed a significant($P<0.01$)and positive correlation between the total UWBIQ-R score and the total Rosenberg's Self-esteem Scale score($r=0.242$).

Table 2 Exploratory factor analysis for domain-specific well-being on the UWBIQ-R($n=1077$)

	Factor loading					
	F1	F2	F3	F4	F5	F6
F1. Satisfaction with political life(SPL) ($\alpha=0.859$)						
When I am involved in a legal dispute, I believe our justice department will make a fair decision.	0.782					
I believe our government cares about its people in administrative activities.	0.735					
I am satisfied that I am guaranteed the ability to exercise my basic political rights(e.g., the right to vote/be elected, the right of supervision and freedom of speech).	0.707					
I think that our government is really serious about fighting criminals.	0.682					
I am satisfied with the social security system.	0.675					
I am satisfied with the degree of transparency of government affairs(village affairs).	0.672					
F2. Satisfaction with interpersonal relationships(SIR) ($\alpha=0.805$)						
I get along well with my colleagues.		0.768				
I have good relationships with those in my neighborhood.		0.758				
I have a good relationship with my family.		0.701				
I am satisfied with my interpersonal relationships.		0.620				
I feel very close to the people around me.		0.602				
I have a good marital/love relationship. (An individual with no spouse or partner would not respond to this item)		0.577				
F3. Satisfaction with one's environment(SEN) ($\alpha=0.801$)						
In our area, it is safe to walk home alone at night.			0.698			
I prefer the environment in our area over that in other places.			0.686			
The security of our public surroundings is good, which makes me feel safe.			0.601			
We have a deep human touch here.			0.598			
The environment around my home is good.			0.501			
F4. Satisfaction with health(SHE) ($\alpha=0.785$)						
I have good health.				0.829		
I am satisfied with my health condition.				0.817		
I am satisfied with my sleep quality.				0.517		
I am satisfied with my diet.				0.458		
F5. Satisfaction with economic life(SEL) ($\alpha=0.751$)						
I am satisfied with our family income.					0.720	
I am satisfied with my dwelling.					0.669	
I am satisfied with my income.					0.621	
I am satisfied with my work.					0.477	
F6. Satisfaction with cultural life(SCL) ($\alpha=0.715$)						
I am satisfied with my cultural activities.						0.709
I am satisfied with the degree of local people's civilization.						0.677
I like the life here.						0.601
I prefer the culture of our area over that of other places.						0.477

Table 3 Pearson correlation coefficients for the UWBIQ-R domains and total score

	SPL	SIR	SEN	SHE	SEL	SCL	GW
SIR	0.372**						
SEN	0.610**	0.398**					
SHE	0.433**	0.429**	0.567**				
SEL	0.430**	0.339**	0.477**	0.521**			
SCL	0.370**	0.356**	0.429**	0.552**	0.594**		
GW	0.334**	0.589**	0.348**	0.473**	0.557**	0.571**	
Total score	0.767**	0.642**	0.795**	0.767**	0.741**	0.721**	0.630**

Notes: SPL=Satisfaction with political life; SIR=Satisfaction with interpersonal relationships; SEN = Satisfaction with one's environment; SHE=Satisfaction with health; SEL=Satisfaction with economic life; SCL=Satisfaction with cultural life; GW=General Well-being. **Correlation is significant at the 0.01 level(2-tailed).

2.5 Internal Consistency

Cronbach's α values were calculated to assess the reliability of the scales. The α coefficient for the total scale was 0.923, that for general well-being was 0.811, and the α values for the dimensions ranged from 0.859 to 0.715(Table 2).

3 Discussion

Based on previous literature, studies involving the measurement of well-being can be classified into two categories: studies measuring general well-being^[11, 12, 14]

and those measuring specific dimensions of well-being^[13, 15, 18]. In the current study, we revised the UWBIQ and developed the UWBIQ-R. The new scale covers both aspects of well-being, including general well-being and domain-specific well-being, to provide a more accurate and comprehensive tool to assess the well-being of Chinese citizens.

Although previous studies^[13, 15] used some common factors in the construction of dimensional well-being, including physical and mental health, material conditions, and interpersonal relationships, these constructions were far from ideal. The construction of the dimensions on the UWBIQ-R, however, was clearer and more systematic.

Regarding the result of the validity analyses, first, the EFA results indicated that the factors on this questionnaire were essentially consistent with its theoretical construction, excluding several biaxial loading items. Second, the correlations between factor scores and total scores indicated that the six factors constituting well-being were independent and heterogeneous. Because these were important factors in the construct of well-being, they were closely correlated with well-being. Third, the CFA results revealed the good fit of the model. The questionnaire that we developed had good construct validity. Fourth, convergent validity indicated that the total UWBIQ-R score was positively correlated with the Satisfaction with Life Scale and Flourishing Scale scores with medium-sized coefficients. However, the total UWBIQ-R score was positively and moderately correlated with the Self-esteem Scale scores. Previous research^[6] has demonstrated that individuals with better well-being tend to be more satisfied with their lives, and this finding is consistent with our result showing an association between higher UWBIQ-R scores and greater life satisfaction. As a result, the convergent and discriminant validity of this questionnaire was good.

The results of internal consistency analyses revealed that the α coefficients for the total scale, the general well-being subscale, and each dimension of domain-specific well-being were all greater than 0.70, which met the criteria for good psychometric use. The α coefficient of either the total scale or the dimensions

of the UWBIQ-R were established relative to the UWBIQ. An additional contribution of this study is that the modified items used in the new questionnaire better conform to the concept of well-being for Chinese citizens and demonstrate better validity.

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- (收稿日期:2017-03-26)