

Article

Psychometric Analysis of a Scale to Assess Social Participation of Chinese Adults

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Abstract: The Social Participation Scale (SPS) is a 17-item questionnaire to assess the social participation of Chinese adults. It was developed using a multimethod approach applying in-depth interviews, qualitative analysis and quantitative psychometric evaluation for construct, convergent validity and internal reliability. In-depth interviews and an expert review panel suggested content validity. Exploratory factor analysis, Confirmation factor analysis, and intercorrelation between dimensions supported construct validity. The SPS was positively correlated with a prosocial tendencies measure and negatively associated with a material values scale, contributing to convergent validity. Internal reliability was also high. These results suggest that SPS has sufficient reliability and validity for use in future research investigating social participation in China and other countries with a few civil organizations.

Keywords: social participation; civic engagement; social sustainability; psychometric analysis; Chinese adults



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1. Introduction

Civic engagement has received considerable attention in these years from social scientists and political analysts [1,2]. Adler and Goggin defined civic engagement as activities where an active citizen participates in the life of a community in order to improve conditions for others or to help shape the community's future [3]. It bolsters positive outcomes both at the social level (e.g., economic success, institutional performance) and individual level (e.g., physical health, well-being) [4–6]. The literature pertaining to civic engagement most commonly describes it in two ways: political participation or social participation [7,8]. Political participation is known as citizens' actions that are intended to influence or support politics [9–11]. Social participation refers to unpolitical activities that entail involvement in society and social affairs [7]. Social participation helps people develop their civic virtues and civic skills. In turn, it builds social capital between individuals that are critical and significant to political participation [9,12,13]. Therefore, many scholars treat social participation as the prelude to political participation [7,9,14].

Although social participation plays a key role in modern society, few psychometric scales are valid to assess individuals' social participation. Most empirical research on social participation has focused on measuring the association activities, as Putnam and Berger described [9,15]. This interpretation of social participation is based on the American context which is full of various civil associations. However, not all countries have plenty of civil organizations for people to attend. For instance, there are a few recreational or sports institutions in China. As a result, many measurements of social participation are not

applicable to Chinese adults. Then, it is not hard to understand that from Gallup's global civic engagement survey in 2016, the social participation of the Chinese people ranked the last one in all 140 countries investigated [16].

Moreover, other measures of social participation focus on the behaviors that researchers are interested in, such as Gallup's Global Civic Engagement Survey, the Integrated Questionnaire for the Measurement of Social Capital (SC-IQ), and the Chinese General Social Survey [17–19]. They created new items for each study and ignored the psychometric properties of the measures. As a consequence, we were unable to find any commonly used and validated measures of social participation for people with limited civil organizations in their community. We believed that it would be beneficial to develop a new scale that builds on the social contexts with a few non-governmental institutions.

This article aims to describe the development and validation of the Social Participation Scale (SPS), a 17-item self-administered questionnaire that assesses the social participation of Chinese adults and we report on its psychometric properties. Developing this scale could help to standardize findings throughout the field, and contribute to a more integrated understanding of social participation.

2. Overall Study Design

To develop and validate a social participation scale under the Chinese context, a series of studies was conducted using methods for scale development suggested by DeVellis [20]. The overview of the study phases for the construction of the SPS is outlined in Table 1.

Table 1. Overview of Study Phases for Construction of the SPS.

Study	Phase Description	Sample	Developmental Components of the SPS	Support of Reliability and Validity
1a	In-depth interviews	$n = 23$	People's illustrations of social participation were collected.	Input from lay experts supports content validity.
1b	Items collection		Items from existing surveys were collected.	Items from existing surveys support content validity.
2	Item selection		Items from study 1 were evaluated to generate the representative items.	Input from experts' review supports content validity.
3	Exploratory factor analysis	$n = 291$	The selected items loaded strongly on three factors.	Construct validity
4	Psychometric analyses	$n = 292$		
	Cronbach's alpha		Alphas were acceptable.	Reliability
	Confirmation factor analysis		The indexes were acceptable.	Construct validity
	Pearson correlation		The correlations between the 3 dimensions were medium.	Construct validity
	Pearson correlation		SPS was positively associated with prosocial tendencies and negatively associated with material values.	Convergent validity

In study 1, we conducted in-depth interviews to obtain qualitative data about Chinese adults' social participation, as a foundation for content validity. Furthermore, we collected supplementary items from the existing surveys. Then, in study 2, the behaviors obtained in study 1 were evaluated and combined to generate a list of common behaviors of social participation, leading to adjustments on items and further improved content validity. In study 3, participants indicated how frequently they performed each of the social participation actions identified in study 2 in the last 12 months. Exploratory factor analysis was applied to remove some items to support the construct validity. In study 4, the reserved items were given to another sample to evaluate the reliability and validity of the SPS. A variety of psychometric methods were used to assess the internal reliability, construct validity, and convergent validity of the new social participation measure.

3. Study 1

The goal of this study was to generate a list of common behaviors about the social participation of Chinese adults. Examples were taken from laypeople's spontaneous responses to how people could help other people or improve group benefits (study 1a), as well as from existing surveys that measure synonymous constructs (study 1b). This inductive-deductive approach was applied to help generate a large, inclusive list of behaviors that were both aligned with the current scientific conceptions of social participation and were grounded in real-world experiences.

3.1. Method

3.1.1. Study 1a In-Depth Interviews

Participants: The sample of in-depth interviews was 23 Chinese adults recruited from the Internet. A key criterion in recruitment was the engagement in community activities for a long time or having rich knowledge of public service activities. Participants were from different industries and different regions in China. They were between the ages of 26 and 64 ($M = 37.96$, $SD = 10.26$). Of the participants, 65% ($n = 15$) were women.

Procedure: The interview proceeded as follows. First, participants provided oral informed consent prior to beginning the interview. Then, an interviewer introduced the concept of social participation to them, that is, the unpolitical activities that an active citizen participates in the life of a community in order to improve conditions for others or to help shape the community's future. The concept of social participation was based on the definitions from previous research [3,7]. After the interviewees fully understood it, they were guided to list the behaviors of social participation as much as possible. Finally, they were asked to report demographic information, such as age, gender, occupation and location. All participants were thanked and debriefed. They did not receive any rewards for their participation.

3.1.2. Study 1b Items Collection

Procedure: A search of related references was implemented in PsycINFO for any measurements containing the keywords, social participation, civic engagement, or civic involvement in combination with the terms measure, scale, and questionnaire. This search led to the identification of several measures that assess social participation. For instance, the Social Capital Assessment Tool developed by World Bank includes items, such as "make the media interested in a common problem" and "volunteer for a charitable organization" [21]. The Organisation for Economic Cooperation and Development (OECD) collected abundant items about social participation in its Social Capital Question Bank, such as "attend the events held at your place of residence" [5]. We added these phrases to the item pool as optional items.

3.2. Result

We obtained many phrases about social participation in study 1. Firstly, we combined the examples that people listed in qualitative responses with items from existing measures. Then, we combined synonymous behaviors, such as "forward news about the current affairs on the Internet" and "comment and tag the current events on the Internet". As a result, study 1 generated an item pool with 42 items (see Table 2).

Most of these behaviors were common and accessible to all Chinese adults, such as "donate money for unfortunate people", "solve the common problems of one's community", and "reduce the use of plastic bags". However, some of the behaviors were unusual for most Chinese, such as "work as a free docent at a museum", or "volunteer to teach in a rural area". Responses to these uncommon behaviors will inevitably influence people's scores on social participation.

Table 2. The item pool of social participation generated in study 1.

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1. donate money for children from poor families
 2. donate money for someone with diseases
 3. donate clothes
 4. donate books
 5. donate blood
 6. buy goods with a label of public welfare
 7. attend the charity sales
 8. attend the activities organized by civil associations
 9. join the non-profit associations
 10. join the property owner committee in one's own community
 11. work as a free docent at a museum
 12. volunteer for group festival activities
 13. volunteer as a social worker
 14. volunteer to teach in a rural area
 15. volunteer to keep public order
 16. forward, comment, and tag the current affairs on the Internet
 17. discuss current issues with other people
 18. give lectures freely to share knowledges
 19. give out leaflets on legal knowledges
 20. give out leaflets on medical knowledges
 21. help people from the rural areas start a business
 22. provide free medical service
 23. provide free legal service
 24. provide free psychological counseling
 25. provide free entertainment performance to the countryside
 26. offer to help mediate other's dispute
 27. volunteer to keep public order
 28. save energy in public places
 29. pick up rubbish in public places
 30. sort the daily garbage
 31. reduce the use of plastic bags
 32. reduce the use of throw-away lunchbox
 33. run or cycle for a charity purpose
 34. give way for an ambulance or a fire truck
 35. save and recycle water
 36. volunteer to clean the public areas
 37. make the media interested in a problem
 38. join the recreational, sports, or academic clubs
 39. attend the collective activities of one's community
 40. volunteer for civil associations
 41. discuss the local affairs, like food security and environmental pollution
 42. solve the common problems of one's community
-

3.3. Discussion

The goal of study 1 was to produce a list of behaviors about social participation that were common in the Chinese context. To identify these behaviors, we collected actions that were proposed by laypeople through qualitative responses and researchers through existing surveys. All the behaviors were consistent with the concept of social participation from previous research [3,7], which ensured the content validity of the SPS.

Most of these behaviors were frequent and common in the Chinese context, which are available materials of the SPS. However, some of them were not accessible to most Chinese, such as guiding people in a museum for free or volunteer teaching in rural areas. Furthermore, there were still some similar items in the list that overlapped each other and resulted in a lengthy scale. Therefore, these behaviors would be reviewed and merged in study 2 to obtain the most representative items of the overarching construct of social participation.

4. Study 2: Item Selection

The goal of study 2 was to narrow down the item list and improve the representation of items. Given that responding to too many similar items could fatigue participants and erode the accuracy of the measurement, we decided to review and further combine the items. An expert review panel, comprised of a professor, a lecturer, and five PhD candidates in social psychology, was invited to evaluate the item list. First, they judged whether the behaviors belonged to social participation and decided to exclude or include them. The criterion in this section was the concept of social participation, as it was introduced to the interviewees in study 1a. Then, the expert review panel decided which of these items should be merged into a common one and how to depict it. The panel contacted every week for approximately a month to critically determine the items of the new social participation measure.

After the panel review, items that had similar descriptions were combined and represented by a more general statement. For instance, “provide free medical service”, “volunteer for psychological counseling”, and “provide unpaid legal assistance” each involved using professional skills to help someone. Therefore, those three items were merged into a more general description, “provide free professional assistance, such as medical, psychological and legal service.” This operation that combined items into a more general one not only reduced the number of items but lessened the variance in score due to factors that are not related to social participation [22]. For instance, in the previous example, someone might have a professional skill in teaching but not in health care, and vice versa. Thus, the specific description used could lead many people to score lower on social participation overall. In contrast, responding to a general item about providing unpaid professional assistance might better reflect the underlying social participation. Therefore, we expected that presenting items with more general statements could promote how well they represent overall social participation for people across various types of contexts. After the evaluation of the expert review panel, the items list contained 27 behaviors on social participation (see Table 3).

Table 3. The obtained items of SPC after the evaluation of the expert panel.

Item	<i>M (SD)</i>	Item-Scale Correlation	α
1. donate money	3.08 (1.28)	0.36 *	0.92
2. donate goods	2.71 (1.36)	0.44 *	0.91
3. donate blood	1.68 (1.15)	0.38 *	0.91
4. buy goods with a label of public welfare	2.85 (1.34)	0.46 *	0.91
5. attend the charity sales	1.86 (1.21)	0.49 *	0.91
6. work as a free docent at a museum	1.44 (0.97)	0.34 *	0.92
7. volunteer to teach in a rural area	1.38 (0.87)	0.29 *	0.92
8. volunteer to keep public order	2.48 (1.35)	0.69 *	0.91
9. offer to help mediate other's dispute	2.59 (1.28)	0.58 *	0.91
10. provide free professional assistance, like medical, psychological and legal service	1.91 (1.27)	0.46 *	0.91
11. volunteer to clean the public areas	2.79 (1.51)	0.73 *	0.91
12. solve the common problems of one's community	1.76 (1.22)	0.68 *	0.91
13. help people from the rural areas start a business	1.40 (0.78)	0.45 *	0.91
14. attend the collective activities of one's community	2.50 (1.47)	0.65*	0.91
15. attend the activities organized by civil associations	3.05 (1.52)	0.66 *	0.91
16. volunteer for civil associations	2.63 (1.40)	0.69 *	0.91
17. volunteer for group festival activities	2.91 (1.46)	0.70 *	0.91

Table 3. Cont.

Item	M (SD)	Item-Scale Correlation	α
18. run or cycle for a charity purpose	2.50 (1.53)	0.56 *	0.91
19. sort the daily garbage	3.69 (1.63)	0.58 *	0.91
20. reduce the use of plastic bags and the disposable goods	4.08 (1.41)	0.62 *	0.91
21. save energy in public places	4.87 (1.25)	0.54 *	0.91
22. pick up rubbish in public places	3.77 (1.33)	0.55 *	0.91
23. save and recycle water	4.45 (1.24)	0.60 *	0.91
24. forward, comment, and tag the current affairs on the Internet	3.86 (1.50)	0.38 *	0.92
25. discuss current issues with other people	4.39 (1.20)	0.46 *	0.92
26. discuss the local affairs	4.23 (1.31)	0.53 *	0.92
27. make the media interested in a problem	2.13 (1.46)	0.50 *	0.91

* $p < 0.001$.

5. Study 3: Exploratory Factor Analysis

The purpose of study 3 was to further evaluate which behaviors about social participation identified in study 2 were more representative. Specifically, we used exploratory factor analysis (EFA) to shrink the initial 27 items to the smallest number of items that accounted for most of the variance in scores.

5.1. Method

Participants: An online crowdsourcing platform in mainland China, which provides functions equivalent to Amazon Mechanical Turk, recruited 312 Chinese adults. 13 participants responded within 2 min and the other eight participants selected the same option on all items. Their data were deleted before data analysis. Finally, we obtained a sample consisting of 291 Chinese adults. This sample size satisfies the recommendation that there should be at least 10 participants for every potential item tested (27) in an EFA [23]. Participants did not report their gender, age, or other demographics.

5.2. Materials

The measure of social participation used in this study was 27 items identified in study 2. We standardized verb tenses into the simple past before conducting the measurement. The introduction of the social participation measure stated that “How often did you perform these behaviors below in last 12 months? Here, we mean the actions out of your free will.” Participants responded to these items on a 6-point Likert scale (1= have never done it, 6 = do it all the time). Items were coded so that higher scores represented higher levels of social participation.

Procedure: Participants were randomly recruited from the Internet. They provided written consent prior to starting the survey and all study procedures were approved by an institutional review board. Then, they responded to items in an online questionnaire, which generally took nearly 3 min to complete. Participants in study 3 obtained 1 CNY (about 0.15USD) for their time spent. Next, EFA was conducted to assess which items accounted for the most variance in the scores. All the results were considered to evaluate which items would be retained in the final scale.

5.3. Results

Preliminary analyses: Prior to performing EFA, we evaluated items' qualities on mean, item-scale correlation and reliability, based on the suggestions from Devellis [20]. As shown in Table 2, the mean of many items deviated from 3.5, especially item 6, item 7 and item 13. Item 7 also had a lower item-scale correlation. Moreover, the item quality on reliability was analyzed by removing the item and computing the alpha coefficient of the rest. However, the alpha value barely changed when every item was removed. Besides,

all of the alpha coefficients were above 0.90, which indicated that the scale should be shortened [20]. Overall, inspecting the mean, item-scale correlation and alpha value was an initial evaluation of items. We will combine these results with the output of EFA to decide which items should be removed.

Then, we assessed the KMO and Bartlett test of sphericity to ensure that the data in this study were appropriate to carry out an EFA. Results showed that KMO was 0.916, and the approximate chi-squared of the Bartlett test of sphericity was 3270.666 ($p < 0.001$). Both suggested that data in study 3 were suitable to carry out an EFA.

5.4. Main Analyses

We performed a principal axis factor analysis to extract the factors. Concerning the potential factors of social participation that are correlated to each other, oblique rotation was applied in the first EFA [20]. The results showed that there were five factors with an eigenvalue above 1, which accounted for 56.37 percent of the total variation. However, the result of the *scree plot* (see Figure 1) showed that there were three factors before the curve tended to be smooth. This manifested that extracting three factors was more reasonable.

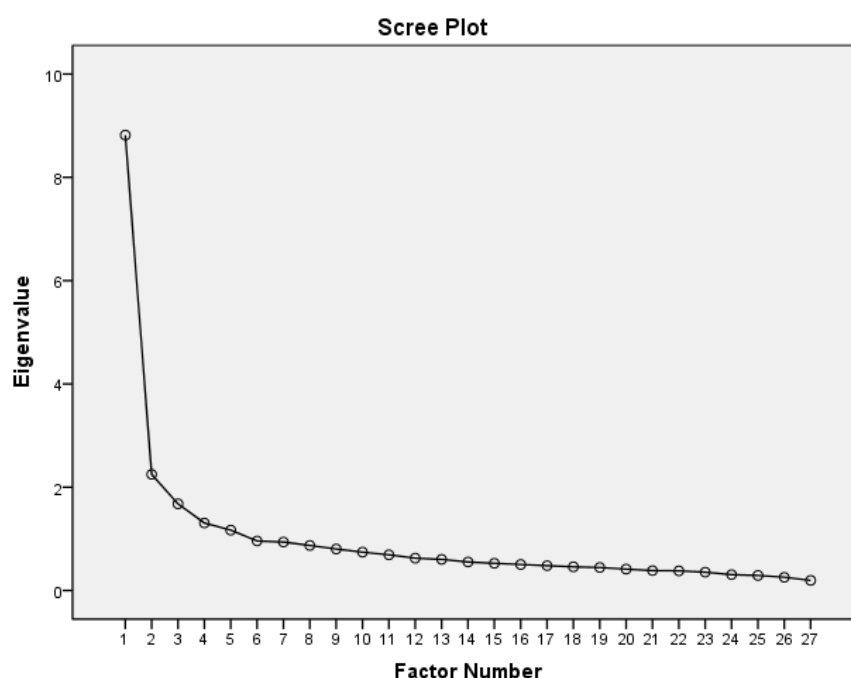


Figure 1. The screen plot in Exploratory Factor Analysis.

Therefore, the second EFA with fixed extraction of three factors was performed. The principal axis factoring method and oblique rotation were used as in the first EFA. From the results of the second EFA, three factors accounted for 47.2 percent of the total variation. It revealed that the 3-factor model fit the data well. Wang concluded two key criteria for retaining items in EFA: the factor loading of an item should be greater than 0.3; the common degree of an item should be greater than 0.4 [24]. Based on the criteria and the initial evaluation of item qualities, some items were removed one by one. The EFA was reperformed once an item was removed. Finally, 13 items were got rid of and the other 14 items were retained (see Table 4).

Table 4. Social Participation Scale Items and their factor load value.

Item	Factor 1	Factor 2	Factor 3	Common Degree
1. volunteered for civil associations	0.85			0.63
2. volunteered for group festival activities	0.81			0.62
3. attended the activities organized by civil associations	0.74			0.50
4. volunteered to clean the public area	0.67			0.57
5. volunteered to keep public order	0.64			0.48
6. resolved the common problems of one's community	0.58			0.47
7. attended the collective activities of one's community	0.57			0.43
8. donated money	0.35			0.16
9. discussed current issues with other people		0.92		0.86
10. discussed the local affairs		0.81		0.70
11. forwarded, commented, and tagged the current affairs on the Internet		0.61		0.37
12. reduced the use of plastic bags and the disposable goods			0.75	0.59
13. sorted the daily garbage			0.66	0.47
14. saved energy in public places			0.62	0.41
Eigenvalue after rotation	5.17	2.06	1.31	
Variance contribution rate (%)	36.93	14.74	9.38	
Cumulative contribution rate (%)	36.93	51.67	61.05	

5.5. Discussion

The new version of SPS includes 14 items of three dimensions, as shown in Table 3. The first dimension contains eight items most of which involve volunteering and free assistance, so it is named voluntary work. The second dimension contains three items about discussing and commenting on social issues and affairs, then it is named as concern to current affairs. The third dimension covers three items on environmental protection and energy conservation. Coincident with these items, it is named as pro-environment. Participants respond to the items on a 6-Likert scale ranging from 1 (have never done it) to 6 (do it all the time). Scores on the 14 items are averaged to form the social participation scale.

It is necessary to explain the existence of two items among the reserved items. One is “donated money”. It had a lower common value than the 0.4 threshold, and its factor loading was only slightly higher than the 0.3 threshold. As a usual form of social participation, however, it was retained in SPS as in many measures of social participation. Another one is “forwarded, commented and tagged the current affairs on the Internet”. The common value of this item was slightly lower than the 0.4 threshold. Nevertheless, its factor loading was high enough. Besides, there should be at least three items under a factor in a well-structured scale. As a result, it was also kept in SPS.

Furthermore, it seems illogical that “attended the activities organized by civil associations” was included in the dimension of voluntary work. In the eyes of Chinese adults, however, attending associational activities is a form of voluntary activity, such as joining an association for providing free medical assistance in rural areas. The higher factor loading of this item on the dimension of voluntary work fully supported this point. This may be related to the Chinese context in which civil institutions mainly consist of volunteer organizations rather than recreational and sports ones.

Three items were added as the validity scale. They were “worked as a free docent at a museum”, “volunteered to teach in a rural area” and “helped people from the rural areas start a business”. It seems that they are not accessible to most Chinese people. As a consequence, they should be pruned away from the scale. Nevertheless, measures of

social participation are strongly affected by social desirability. These items look so similar to other items that they are hard to be identified as filters. Therefore, they were retained as a validity scale in SPS. Considering that dishonest respondents tend to choose higher points due to social desirability, we established the norm of validity scale below. If more than one of three items in the validity scale are responded as 5 or 6 (respectively, means “often do it” and “do it all the time”) on the 6-point Likert scale, the data of the participant will be judged as a false report.

6. Study 4: Psychometric Analyses

The purpose of study 4 was to evaluate the psychometric characteristics of the SPS. First, we expected the scale to show adequate internal consistency. Second, we assessed the construct validity of the SPS using confirmation factor analysis (CFA) and Pearson correlations between three dimensions. We hypothesized that the 3-factor model would show an adequate fit to the data from our sample. In addition, the intercorrelations between dimensions would be small or medium. Last, we evaluated convergent validity by investigating the associations between the SPS and related constructs. Given that prosocial behavior (e.g., volunteering, donations) is synonymous with social participation [5,7] and prosocial tendencies accurately predict prosocial behavior [22], we hypothesized that the SPS would be positively associated with prosocial tendencies. Moreover, social participation involves a concern for other people’s benefits and the public goods, which is negatively correlated with materialism, or a self-centered value of increasing personal wealth [25]. Therefore, we hypothesized that the SPS would be negatively linked to materialism.

6.1. Methods

Participants: 328 adults were recruited from an online crowdsourcing platform in mainland China, which provides functions equivalent to Amazon Mechanical Turk. Twenty-one participants finished measurements within 1 min, and the other fifteen individuals reported scores that were too high on the validity scale. The data of these participants were deleted before data analysis, leaving a final analytic sample of 292 participants from 29 provinces. A power analysis using G*Power [26] indicated that the sample size provided sufficient power to detect a large or moderate effect size in correlational analyses. There were 84 males, 204 females and four did not report their gender. The age of the sample ranges from 19 to 59 ($M = 33.91$, $SD = 9.44$).

6.2. Measures

Social participation scale: The SPS developed in Study 3 was used to assess social participation. See earlier for a description and Table 3 for the full scale.

Prosocial tendencies measure: The prosocial tendencies measure (PTM) was developed by Carlo and his colleagues [27]. The Chinese version of PTM was revised by Kou and her cooperators [28]. The revised PTM contains 26 items attached to six dimensions (i.e., altruistic, compliant, emotional, dire, public, and anonymous). Items include statements, such as “I can help others best when people are watching me” and “It is most fulfilling to me when I can comfort someone who is very distressed”. Participants were asked to rate the extent to which statements described themselves on a 5-point scale ranging from 1 (does not describe me at all) to 5 (describes me greatly). Although the PTM was developed for adolescents, the statements of its items do not involve words about age. Therefore, it is also appropriate for adults. Cronbach’s alpha for the PTM used in this study was 0.92.

Material values scale: The material values scale (MVS) was developed by Richins and Dawson [29]. Then, Li and Guo revised the Chinese version of the MVS [30]. The MVS includes 13 items, such as “I envy people owning expensive houses, cars and clothes” and “I like the life with many luxuries”. Individuals responded to the MVS on a 5-point scale, from strongly disagree to strongly agree. Cronbach’s alpha for the MVS was 0.79.

Procedure: A link to the survey was posted online and the survey was on an online crowdsourcing platform in mainland China. People who clicked on the link and con-

sented to participate went on to complete the measures. The survey took about 6 min to complete all the responses. Participants received 1 CNY (about 0.15USD) for their time spent (between 5–10 min). We calculated composite scores for each measure. Then, we used Cronbach's alpha to assess internal reliability. Next, we conducted a CFA and computed intercorrelations between three dimensions to test the construct validity. Finally, we calculated correlations to evaluate relationships among the constructs.

6.3. Results and Discussion

Internal Reliability: The Cronbach's alpha for the whole scale was high, $\alpha = 0.85$. For the dimensions, the alpha value was 0.84 for voluntary work, 0.74 for concern to current affairs, and 0.64 for pro-environment. The Cronbach's alpha value for pro-environment was marginally acceptable, alpha values for the whole scale and other two dimensions were all above the level of 0.70 [31]. These results showed that the SPS demonstrated adequate internal consistency.

Construct validity: CFA. To corroborate the obtained 3-factor structure of the SPS, we conducted a confirmatory factor analysis on the sample of participants from study 4. The CFA was performed using the maximum likelihood estimation procedures of AMOS 27.0. According to the commonly applied indexes [32–34], the 3-factor model provided an adequate fit to the data, $\chi^2 (df = 73) = 122.41, p < 0.001, \chi^2/df = 1.68, GFI = 0.95, AGFI = 0.92, TLI = 0.95, CFI = 0.96, RMSEA = 0.048, 90\% CI [0.033, 0.063]$. These results supported the hypothesized structure of the SPS in which the scale's items were thought to assess three dimensions (i.e., voluntary work, concern to current affairs, and pro-environment).

Construct validity: Intercorrelations. Construct validity was also tested using Pearson correlation to investigate the intercorrelations between dimensions. Voluntary work was correlated with concern to current affairs ($r = 0.33, p < 0.01$) and pro-environment ($r = 0.45, p < 0.01$), concern to current affairs was related to pro-environment ($r = 0.40, p < 0.01$). According to the suggestion from Ferguson [35], the effect size of a correlation greater than 0.2 and less than 0.5 is considered as medium. As hypothesized, all the intercorrelations between the three dimensions were medium. This suggested that the three dimensions of the SPS were relatively independent and that the scale showed adequate construct validity.

Convergent validity: Convergent validity was tested by investigating the associations between social participation and related constructs using the Pearson correlation. The demographic variables age and gender were both controlled for in the model. As hypothesized, social participation was positively and significantly associated with prosocial tendencies ($r = 0.41, p < 0.001$), and negatively and significantly correlated with material values ($r = -0.16, p = 0.006$). These findings provided empirical evidence to support the convergent validity of the SPS.

7. General Discussion

The purpose of this article was to describe the development of SPS and its psychometric properties. The results of the psychometric investigation showed that SPS is indeed a psychometrically sound measurement. To our knowledge, it is one of few scales on social participation for use in context with limited civil organizations that have been developed using a rigorous scale development process and thoroughly tested for validity and reliability. The SPS will allow researchers and practitioners to assess social participation in a broader scope for more in-depth research.

In exploratory factor analysis, we analyzed the internal structure of the SPS and tested the number of factors that provided the best fit to this instrument. We found a three-factor structure for the SPS. Consistently, confirmatory factor analysis identified the three-factor structure. Concerning the items covered and their content definition, we named the factors voluntary work, concern to current affairs, and pro-environment. It seems that these three dimensions constitute the underlying construct of social participation in the Chinese context.

Voluntary work depicts social participation in providing unpaid help to others or improving the group's situation regardless of return. People provide help to other people at the expense of their own time, money and other resources, such as donating, resolving public problems, and providing professional help for free. More importantly, they carry out these behaviors according to their own free will rather than external pressure. Consistent with other measures of social participation [5,17,36], voluntary work constitutes part of social participation in Chinese society.

Concern to current affairs maps social participation in paying attention to the society or community issues. For the purpose of caring about their situations, people focus on the current events and discuss them with other people. With the popularization of the Internet, furthermore, many people comment on events and discuss them with strangers online. Concern for current affairs signifies a level of interest in social issues that manifests a predisposition of civic-minded collective action [5]. It is a considerable element in Chinese social participation.

Pro-environment focuses on social participation in environmental protection. Realizing the significance of the environment in human survival, people protect it to improve their interests or to shape the future of their group. They reduce using disposable goods and sort the household garbage every day, even if these behaviors bring inconvenience to them. Pro-environment is another form of social participation in Chinese circumstances, although it is sometimes treated as a type of voluntary activity.

These three dimensions contain fourteen items, which constitute the measurement part of the scale. Besides, the SPS includes a validity part including three items. With respect to that, social participation is susceptible to social desirability, and we need some items to screen the false responses. Then, these items were selected to play the filters. They look so similar to other items in the SPS that respondents can hardly identify them as filters. People who report high scores on these items are likely to respond dishonestly.

According to the results of the reliability analysis, the overall internal consistency of the SPS was good. This revealed that items in SPS were highly intercorrelated and provided evidence that the items captured social participation as a common factor. Results of EFA, CFA, and intercorrelations among dimensions all suggested that the SPS had good construct validity. Further analysis on convergent validity showed that the SPS was found to be correlated as expected with pro-social tendencies and material values. They provided strong empirical support for the validity of the SPS. Overall, according to our results, SPS seems to be a reliable and valid measure for social participation.

There are several limitations to this study that should be recognized when considering its findings. First, the alpha coefficient of the dimension of pro-environment was acceptable but not high. This may be caused by a small number of items in this dimension. More items about environmental protection need to be included in future versions of SPS to improve the reliability of this dimension. Second, the validity scale in the SPS may cause the loss of some valid data. To deal with the social desirability in response to social participation, we applied three detailed behaviors as a validity scale. They are undetectable and may work better than the items for the attention check. However, they may inevitably lead to the loss of some valid data from participants who perform these behaviors. Third, many cities in China implemented a garbage sorting policy after we collected our data. The policy may promote people's garbage sorting due to external pressures. However, it contradicts the nature of social participation, which highlights that people perform the behavior of their own free will. As a result, future research should replace the item about garbage sorting with other ones if the region is enforcing similar policies. Finally, aspects of social participation may not have been captured that are relevant to younger age groups. Our in-depth interviews were conducted with a population of adults. However, children and adolescents under the age of 18 may have different types of social participation than adults. For instance, they are inclined to perform social participation through helping a classmate who fell down or volunteering to tutor or coach younger children [37]. Information about

children's behavior types on social participation should be obtained to develop an effective social participation scale for children.

Despite these limitations, our studies developed a new measure for social participation with good psychometric properties among Chinese adults. To our knowledge, this is one of few scales that have been designed to measure social participation in societies with limited civil organizations and developed using a rigorous scale development process. Although there is an item in SPS that involves participation in associational activities, it does not imply that the SPS also applies to societies with abundant public organizations. The Chinese people comprehend associational involvement as a type of voluntary activity. Therefore, researchers and practitioners should remain cautious when they apply SPS to other contexts. Overall, our work fills the gap of the lack of effective measurements on social participation. It extends research in this area and may be useful to researchers and practitioners as they continue to evaluate and cultivate social participation.

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