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Personal Social Capital Scale: an instrument for health and behavioral research

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Abstract

The concept of social capital has drawn much attention in social and behavioral epidemiology and health education research. The purpose of this study is to develop the 'Personal Social Capital Scale' for quantitative survey studies of social factors that are related to health and behavior. The instrument contained 10 composite items based on 42 items for assessing personally owned social capital, including bonding and bridging capitals. The instrument was assessed using cross-sectional survey data collected among 128 participants (64 women) with a participation rate of 95%. Results from correlation and confirmatory factor analysis indicated adequate reliability and internal consistency. The mean score of the scale was 25.9 (SD 5.2) for total social capital, 15.2 (SD 3.0) for bonding social capital and 10.8 (SD 3.4) for bridging social capital. The scale scores significantly predicted a number of theoretically related factors, including people skills, being sociable, social capital investment, informational support, instrumental support, emotional support and collective efficacy. This instrument provides a new tool for cross-cultural research to assess personally owned social capital.

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Introduction

Social capital, as a relatively new concept in the fields of social epidemiology and health education research, has drawn much attention in recent years. The term capital is often used in economics to describe assets that can be invested in order to generate profits. The term social capital in health and behavior research can be defined as the sum of durable, trustworthy, reciprocal and resource-rich (wealth, education, social status and political power) network connections that are used as an asset to empower a society and its members [1–9]. Effective health education would benefit by addressing personally owned social capital to achieve targeted behavior changes.

Data from a number of studies suggest that inadequate social capital is associated with deviate and health risk behaviors [10–14], perceived poor health status [5, 15–17], mental health disorders [18] and increased mortality [19, 20]. Several intervention studies have reported that enhancing social capital results in declined risk of alcohol use [21–23], increased likelihood of engagement in human immunodeficiency virus/acquired immunodeficiency virus prevention activities [24] and increased odds for children from low-income families to be protected against negative health consequences [25].

The concept of social capital was first examined by Durkheim in 1897 when he studied social influences on suicide [26]. Despite some differences regarding the exact meaning of social capital, consensus has emerged that 'without network connections, there is no social capital' [27–29]. Reading a book, listening to music or watching television alone in the privacy of one's home do not create

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social capital, but having a cup of coffee with a friend or playing on a sports team may create social capital. The social capital of an individual can therefore be referred to as his or her accumulated network connections that are durable, trustworthy, reciprocal and full of socioeconomic resources while the social capital collectively owned by a group would be referred to as the integration of social capitals owned by its individual members [5, 6, 30–32].

Social capital consists of a primary means by which individuals in a society integrate with others and the broad social environment. Collectively owned social capital can be considered as the primary psychosocial and cultural milieu [2, 6] while individually owned social capital enables individuals to reap returns from society [6]. Researchers have hypothesized four paths or mechanisms by which social capital may affect health and behavior: 'informational support', 'instrumental support', 'emotional support' [29] and collective efficacy [13, 33]. Individuals who possess adequate social capital themselves can effectively obtain informational, instrumental and emotional support. Adequate social capital is necessary for the development of collective efficacy—voluntary actions by community members against deviate and risk behaviors that devalue the community [13, 33].

The question of whether or not social capital is a collective property or personal asset continues to be debated [2, 29, 31, 32, 34]. In the present study, we have chosen to focus on individually owned network connections, a measurable characteristic at the individual level, as the basis of social capital that links a person to the society. Social capital can be divided into two subtypes: bonding capital and bridging capital. According to several social capital researchers [9, 35, 36], bonding capital refers to the network connections that link people of a similar kind, with the bonds being formed through common interests and mutual attraction. Bridging capital refers to the network connections that link people of different kinds, with the connections being made through social groups and organizations. Within the bonding and bridging capitals, there are vertical connections across the power gradients in individuals, groups and organizations. These connections are often referred to as linking social capital [9, 37, 38].

There is a lack of theory-based and validated instruments for assessing personally owned social capital [10, 14, 18, 28, 36]. Using both qualitative and quantitative methods, one study used the short form of Adapted Social Capital Assessment Tool (SASCAT), a nine-item instrument derived for assessing personally owned social capital [30]. The original instrument was developed by a team from the World Bank [39]. Although findings from that evaluation study indicated that the derived tool was promising, the items used for assessing group memberships in the SASCAT are 'the most problematic' (p.951). Respondents experienced difficulties understanding such generic groups as 'trade union', 'community association' and 'credit/funeral group' that are not silent in the context of a country. The purpose of this study is to develop and evaluate a new instrument, the 'Personal Social Capital Scale', designed specifically for use in survey studies to assess personally owned social capital.

We conducted this study among residents of rural and urban areas as well as rural-to-urban migrants in China. China is a nation deeply affected by a Confusian culture and collectivist ideology [40], which may promote social capital development, particularly bonding capital. The economic reform in China since the later 1970s has attracted millions of rural residents to the rapidly developed urban areas [41]. The rural-to-urban migration may weaken the social capital previously owned by these migrants. In addition, the open policies of China in the past three decades have greatly increased the exposure of China to western societies that are characterized by individualistic ideology [42]. This cultural exchange in China may result in changes in interpersonal relationship and people's trust in government and social organizations, affecting the development of social capital, particularly bonding capital. In summary, China, like many of the nations in the world, is experiencing cultural transitions that may affect social capital and

thus may serve as a useful case study for social capital research.

Materials and Methods

Development of the Personal Social Capital Scale

The Personal Social Capital Scale was developed in three steps: First, a collection of potential items was developed by several investigators through a literature review, brainstorming, item development and group discussions. Second, the first author of this article collected the developed items, prepared a draft version of the instrument both in Chinese (Mandarin) and English and distributed it among all the investigators (English or Chinese–English bilingual) for comments and feedback. Third, the first author revised the draft version by incorporating input received from these investigators. This process was repeated until consensus was reached. The draft instrument in Chinese was then pilot tested among 12 adults (six women) to assess the acceptability of the instruments by participants with different levels of school education. The finalized scale consisted of 10 items with a total of 42 subitems. The 10 items, termed as Cap1–Cap10, are presented in the Appendix.

All 42 subitems were assessed using a five-point Likert scale with 1 = 'none' or a few to 5 = 'all' or a lot (see the Appendix 1 for details). Scores for the individual 10 items were calculated by (i) summarizing the individual subitem scores and (ii) dividing the sum score by the number of subitems. For example, item Cap1 consisted of six subitems to assess the size of network connections. The score of this item was computed by first summarizing the six subitem scores and then dividing the subtotal by six. After item scores were derived, bonding social capital score was calculated by adding together the item scores for the five items Cap1 through Cap5; bridging social capital score was calculated by adding together the item scores for the five items Cap6 through Cap10. The summation of the bonding capital score and the bridging capital score yielded the total social capital score.

Participants and data collection

Participants of this study consisted of 128 sampled adults 18 through 50 years of age (64 female); 44 were urban residents, 40 were rural residents and 44 were rural-to-urban migrants (termed as rural migrants thereafter); 60 were recruited from Beijing and 68 were recruited from Wuhan. Beijing is the national capital of China, located in northern China and Wuhan is the provincial capital of Hubei, located in central China. There are millions of rural migrants in these two cities [41]. We included participants from different settings such that the developed instrument could be employed to assess social capital for populations with diverse backgrounds.

The study participants were recruited in their residential areas. At each of the two study sites, rural residents were recruited from a group of consecutive households in one village, urban residents were recruited from a group of consecutive households on one street and rural-to-urban migrants were recruited from their urban residential locations in one urban district. One participant per household was selected. For households with more than one eligible adult, only one was selected using the random digits table method. Among all participants approached, 95% agreed to participate.

The participants ranged from 18 through 50 years of age with an average age of 31.9 (SD = 9.8). The main characteristics of the participants are summarized in Table I.

A paper-and-pencil questionnaire was used for data collection. Together with the social capital measures, the questionnaire consisted of 98 questions and took approximately 30–40 min to complete. Trained researchers from Beijing Normal University and Wuhan Centers for Disease Prevention and Control administered the questionnaire in private rooms located either at the participants' home or in places that the participants preferred (e.g. office buildings or labs). All recruited participants who signed the written informed consent completed the survey. Approval of the data collection protocol was obtained from the scientific administration of the two collaborating institutes in

Table I. *Selected characteristics of study participants*

	Male		Female		Total	
	N	%	*N*	%	*N*	%
Total	64	50.0	64	50.0	128	100.0
Age (in years)						
<30	34	53.1	30	46.9	64	50.0
30+	30	46.9	34	53.1	64	50.0
Mean (SD)	31.1	(9.5)	32.7	(10.1)	31.9	(9.8)
Race						
Han Chinese	56	87.5	50	78.1	106	82.8
Others	8	12.5	14	21.9	22	17.2
Education						
Primary	2	3.1	10	15.6	12	9.4
Middle	25	39.1	23	35.9	48	37.5
High	27	42.2	25	39.1	52	40.6
Post-secondary	10	15.6	6	9.4	16	12.5
Geographic location						
Beijing	36	56.3	24	37.5	60	46.9
Wuhan	28	43.8	40	62.5	68	53.1
Resident status						
Rural migrants	22	34.4	22	34.4	44	34.4
Rural residents	21	32.8	19	29.7	40	31.3
Urban residents	21	32.8	23	35.9	44	34.4

SD, standard deviation.

China and approval of the use of the collected data was obtained from the Human Investigation Committee at Wayne State University in the United States.

Variables for assessing construct validity

Three variables were used to assess construct validity: gender, educational attainment (primary or less, middle school, high school and post-secondary) and residential status (rural resident, urban resident and rural-to-urban migrant). Reported data indicated that males often scored higher on social capital measures than females [33, 43]. People with more education possessed more social capital than people with lesser education [44, 45]. Studies have shown that urban residents posses less social capital than rural residents due to urbanization [9]. Migrants in the destination may possess less social capital than local residents because of the weakening of their social ties with people in the origin [24]. Differences in social capital across these groups will provide data on construct validity of the developed scale [46, 47].

Variables for assessing predictive validity

Variables related to social capital accumulation

Three groups with a total of 12 variables were included. Group one consisted of two intrapersonal factors (e.g. social contact and people skills). The variable 'social contact' was assessed using the question, 'Among all the people you know, with how many do you interact well?' (1 = none and 5 = all). The variable 'people skills' was assessed using the question, 'How often do you have to deal with people in your work?' (1 = 'no need to deal with people' and 5 = 'always need to deal with people').

Group two consisted of two positive community environmental factors, e.g. 'supportive community' and 'collaborative community'. The variable supportive community was assessed using the question: 'Among all people who live in your community and the neighborhood, how many of them can support each other and get along with each other well?' The variable collaborative community was assessed using the question: 'Among all the governmental, political, economic, social, cultural, recreational groups and organizations in your community, how many can collaborate with each other?' A five-point Likert scale was used to assess the two questions with 1 = none and 5 = all.

Group three consisted of eight activities that were theoretically associated with the accumulation of social capital: 'chatting with others', 'gift giving', 'working together', 'playing together', 'visiting each other', 'communicating through telephone or internet', 'offering assistance to others' and 'participating in parties and gatherings'. Participants were asked to record the frequency by which they engaged in these activities during their leisure time (response options: 1 = 'never', 2 = 'rarely', 3 = 'sometimes', 4 = 'often' and 5 = 'every day').

Variables being affected by social capital

Four variables were included: informational support, instrumental support, emotional support and perceived collective efficacy. Informational, instrumental and emotional supports were assessed in terms of people (e.g. family members/relatives,

neighbors, friends/acquaintances), groups and organizations (e.g. cultural, recreational, daily life and governmental, political, social economic). The variable informational support was assessed using the question, 'How many of them (these people/groups/organizations) would help you when you are in need of information to look for a new job or to gain work-related knowledge and experiences?' The variable instrumental support was assessed using the question, 'How many of them (these people/groups/organizations) would help you when you need money or materials?' The variable emotional support was assessed using the question, 'If people know that you have difficulties in life or do not feel good, how many of them (these people/groups/organizations) would help you?' A five-point Likert scale was used to assess these questions with 1 = none and 5 = all. The Cronbach alpha was 0.80 for informational support, 0.78 for instrumental support and 0.81 for emotional support. Composite scores were calculated for these variables such that a high score indicates a greater perceived support.

The variable 'perceived collective efficacy' was defined as the anticipated actions from people in the community (e.g. family members and relatives, neighbors, friends, governmental, political and social groups/organizations, cultural and recreational groups/organizations) against deviate behaviors [13]. The variable was assessed using the question (five subitems), 'If anyone sees people engaging in activities that may devalue the community you are living in, such as smoking in restricted places, getting drunk or using illegal drugs, selling or buying sex, how many of them in your community will try to stop such activities?' A five-point Likert scale was used to assess the measure with 1 = none and 5 = all (Cronbach alpha = 0.87). A composite score was derived by summarizing the item scores such that a higher score indicates a greater perceived collective efficacy.

Statistical analysis

Statistical analysis was focused on the assessment of reliability and validity of the developed instrument. Correlation analysis (Cronbach alpha and item-total correlation) was used to assess reliability and internal consistency. Confirmatory factor analysis (CFA) was used to assess the scale structure. The goodness-of-fit (GFI)>0.9, comparative fit index (CFI)>0.9 and root mean square of error approximation (RMSEA) <0.5 were used as the criteria of model fitting. Student's *t*-test and one-way analysis of variance were used to assess construct validity. Linear regression analysis was used to assess the criterion-related predictive validity. All statistical analyses were conducted using the software SAS (version 9.13, SAS Institute, Cary, NC).

Results

Item response

Among the 128 study participants, 124 (98%) responded to all 42 subitems under the 10 social capital items. Among the four participants who did not respond to all items, three were urban residents (two with primary education and one with middle school education) and one was rural migrant (with a primary level education). These participants did not respond to the subitems regarding 'coworkers/fellows' or subitems regarding anticipated assistance from 'friends'. Scores of the five individual items for bonding social capital ranged from 2.33 to 3.29 (SD varying from 0.66 to 0.76) and scores of the five individual items for bridging social capital ranged from 1.90 to 2.41 (SD varying from 0.73 to 0.90).

Figure 1 depicts the profile of the 10 items of the scale. In general, participants scored higher on items assessing bonding capital than on items assessing bridging capital. Urban participants scored lower than rural participants on nine of the 10 instrument items, reflecting the reduction of social capital with urbanization. Rural migrants scored lower than rural participants on two items, Cap2 (routine contact with network members) and Cap3 (trust network members), reflecting the weakening of their rurally rooted network connections and the lack of trust of others in the urban destination. Rural migrants scored higher than rural residents on two other items, Cap7 (participating more often in groups/organizations'

activities) and Cap10 (more resources possessed by groups/organizations).

Reliability and internal consistency

Correlation analysis indicated that all item cores were positively correlated with the total scale score. The correlation coefficients varied from 0.37 to 0.77 ($P < 0.01$ for all) for the overall Personal Social Capital Scale, from 0.53 to 0.77 for the bonding capital subscale and from 0.42 to 0.74 for the bridging capital subscale. The estimated Cronbach alphas (Table II) were 0.87 for the overall scale, 0.85 for the bonding capital subscale, and 0.84 for the bridging capital subscale. In addition, the estimated Cronbach alpha varied in a narrow range from 0.77 to 0.89 for various subgroups of the sample.

The correlation coefficients presented in Table III provide further data on the internal consistency of the instrument. The five items Cap1–Cap 5 measuring bonding social capital were highly positively correlated with each other (the correlation coefficients ranging from 0.37 to 0.74 and $P < 0.01$ for all); likewise, the five items Cap6–Cap10 measuring bridging social capital were highly positively correlated with each other (the correlation coefficients ranging from 0.28 to 0.63 and $P < 0.01$ for all).

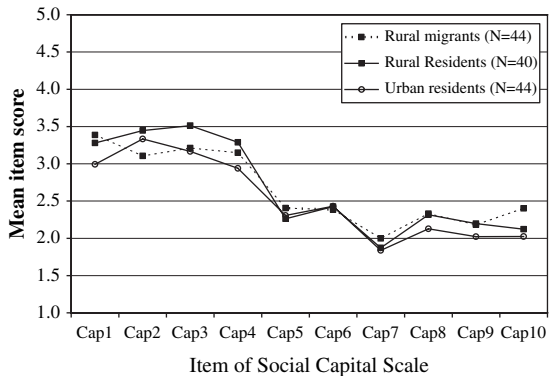

Fig. 1. Profile of the Personal Social Capital Scale, stratified by residential status.

Table II. *Cronbach alpha of the Personal Social Capital Scale and its two subscales (bonding and bridging capital), overall and stratified by gender, age and study site*

Category	*N*	Cronbach alpha		
		Social capital	Bonding capital	Bridging capital
Total sample	128	0.87	0.85	0.84
By gender				
Male	64	0.85	0.80	0.84
Female	64	0.88	0.88	0.83
By age group (years)				
<30	64	0.88	0.88	0.86
⩾30	64	0.87	0.84	0.82
By sample location				
Beijing	60	0.84	0.77	0.83
Wuhan	68	0.89	0.89	0.86

Confirmatory factor analysis

As expected, results from CFA indicated that the two-factor model fitted the data quite well (Fig. 2), GFI = 0.95, CFI = 0.97, RMSEA = 0.06, chi-square = 30.6, df = 34, $P > 0.05$ and chi-square/df = 0.9. The standardized coefficients of the five items constituting bonding capital and the five items constituting bridging capital ranged from 0.52 to 0.90, all were statistically significant ($P < 0.01$). The factor bonding capital was correlated with the factor bridging capital (the covariance coefficient = 0.57, $P < 0.01$).

Construct validity

Data on known-group differences are frequently used as evidence supporting for construct validity [46–49]. As expected, data in Table IV indicate that when the Personal Social Capital Scale was used as measurement tool, men possessed more social capital than women, including the total personal social capital ($P < 0.01$), the bonding ($P < 0.01$) and the bridging ($P < 0.05$) social capital. Participants with more education possessed a greater amount of social capital, and the difference was statistically significant for the overall social capital ($P < 0.05$) and bonding capital ($P < 0.01$). Participants <30 years of age scored higher than participants 30 years of age and older on total social capital, bonding capital and bridging capital. Urban residents appeared to possess less social capital than rural residents and rural migrants, while rural migrants appeared to

Table III. *Correlations of item scores of bonding social capital and bridging social capital (Pearson correlation coefficients r)*

	Bonding social capital				Bridging social capital			
	Cap1	Cap2	Cap3	Cap4	Cap6	Cap7	Cap8	Cap9
Cap2	0.50**	1.00	0.74**	0.46**	0.40**	0.41**	0.11	0.32**
Cap3	0.43**	0.74**	1.00	0.45**	0.38**	0.33**	0.12	0.33**
Cap4	0.37**	0.46**	0.45**	1.00	0.40**	0.36**	0.46**	0.32**
Cap5	0.51**	0.68**	0.72**	0.49**	0.39**	0.35**	0.17	0.37**
Cap7	0.25*	0.41**	0.33**	0.36**	0.58**	1.00	0.38**	0.58**
Cap8	0.06	0.11	0.12	0.46**	0.28**	0.38**	1.00	0.38**
Cap9	0.20*	0.32**	0.33**	0.32**	0.59**	0.58**	0.38**	1.00
Cap10	0.29**	0.40**	0.39**	0.38**	0.63**	0.57**	0.36**	0.71**

The items measuring bonding capital were highly correlated with each other (correlation coefficients within the dash-lined triangle in the left panel); the items measuring bridging capital were highly correlated with each other (correlation coefficients within the dash-lined triangle in the right panel); while not all items measuring bonding capital were highly correlated with all items measuring bridging capital. *$P < 0.05$, **$P < 0.01$.

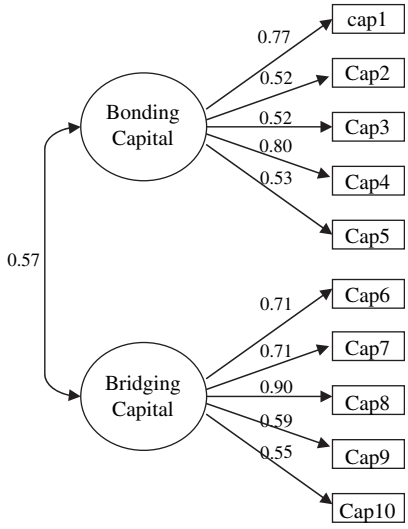

Fig. 2. CFA modeling of the Personal Social Capital Scale (N = 128, 50% female). Model fitting: GFI = 0.95, RMSEA = 0.06, chi-square = 30.6, df = 34, $P > 0.05$; chi-square/df = 0.9, CFI = 0.97. **Note:** the ten coefficients assessing the association between the individual social capital items and the two social capital subscales and the covariance assessing the association between the bonding capital and the bridging capital were all statistically significant ($P < 0.01$).

Table IV. *The assessment of construct validity of the Personal Social Capital Scale using the theory-based group difference approach*

Subgroups	Mean score (SD)		
	Total social capital	Bonding social capital	Bridging social capital
Total sample	25.90 (5.25)	15.15 (3.01)	10.76 (3.37)
Gender[a]			
Male	27.25 (5.06)**	15.94 (2.33)**	11.31 (3.54)*
Female	24.54 (5.68)	14.37 (3.40)	10.20 (3.11)
Education[b]			
Primary or less	22.72 (5.33)*	12.72 (3.78)**	10.00 (2.29)
Middle school	25.18 (5.31)	14.56 (2.68)	10.62 (3.37)
High school	26.75 (5.75)	15.90 (2.91)	10.84 (3.63)
College or more	27.82 (4.47)	16.30 (2.41)	11.50 (3.21)
Residential status[b]			
Urban residents	24.83 (5.85)	14.47 (3.35)	10.40 (3.37)
Rural residents	26.39 (5.30)	15.79 (2.54)	10.61 (3.49)
Rural migrants	26.50 (5.36)	15.26 (2.97)	11.24 (3.27)

[a]Student's *t*-test for gender differences.
[b]One-way analysis of variance for cross-group differences. SD, standard deviation. *$P < 0.05$, **$P < 0.01$.

possess less bonding capital and more bridging capital. These between-group differences are consistent with the findings from both theoretical analysis and empirical results [9, 33, 43–45], supporting for construct validity of the instrument.

Predictive validity

Predictive validity is a type of criterion-related validity, assessing whether the instrument can predict the measures it should theoretically predict [46, 47]. A significant association of the scale score with the

variable that is assumed to be associated with provides evidence supporting for the validity of the instrument. The standardized regression coefficients in the upper panel of Table V indicate that all 12 variables in the three groups (intrapersonal, environmental and social capital investment) were positively associated with social capital. For example, in predicting the total social capital scores, the standardized regression coefficient *b* varied from the lowest of 0.29 ($P < 0.01$) for the intrapersonal variable 'social contact' to the highest of 0.49 ($P < 0.01$) for the variable 'helping others'. Among these three groups of prosocial capital variables, the predictivity was in general the greatest for the variables measuring social capital investment (*b* was >0.4 for most variables), the smallest for the variables measuring intrapersonal factors (*b* was ~0.3) and mid-range for the variables measuring environmental factors (*b* was ~4.0).

Data in the bottom panel of Table V contain the standardized regression coefficients for the four variables that were hypothetically to be affected by social capital. Data in the table indicate that scores on the Personal Social Capital Scale (including its two subscales) were all positively associated with the perceived informational, instrumental and emotional support and a strong sense of perceived collective efficacy ($P < 0.05$ or 0.01 for all). The evidence of high predicitivity of the Personal Social Capital Scale (including being predicted and predicting others) presented above suggests adequate validity of this developed instrument.

Table V. *Predictive validity—standardized regression coefficients (b) assessing factors associated with social capital measures (N = 128)*

	Total capital	Bonding capital	Bridging capital
Pro-social capital variables[a]			
Intrapersonal factor			
Social skills	0.32**	0.30**	0.25**
Contact	0.29**	0.245**	0.26**
Environmental factor			
Supportive community	0.38**	0.39**	0.28**
Collaborative community	0.44**	0.38**	0.38**
Investment in social capital			
Chatting	0.40**	0.48**	0.23*
Gift giving	0.35**	0.38**	0.23*
Working together	0.38**	0.43**	0.23*
Playing together	0.42**	0.36**	0.36**
Visiting others	0.44**	0.44**	0.33**
Phone/internet	0.45**	0.49**	0.30**
Helping others	0.49**	0.46**	0.39**
Parties/gathering	0.43**	0.49**	0.26**
Variables related to social capital[b]			
Informational support	0.64**	0.56**	0.54**
Instrumental support	0.62**	0.62**	0.47**
Emotional support	0.62**	0.60**	0.49**
Collective efficacy	0.33**	0.30**	0.24*

[a]These variables were used as the independent variables in linear regression models to predict social capital measures.
[b]These variables were used as the dependent variables to be predicted by social capital measures. *$P < 0.05$, **$P < 0.01$.

Discussion and conclusions

The 10-item Personal Social Capital Scale that we have reported in this study provides a useful and practical tool that is much needed for social epidemiology, health behavior and health education research [24, 28, 36, 37]. Based on the theories and models from the published literature and our own research, this instrument is appropriate for assessing personally possessed social capital, including bonding capital and bridging capital. This scale is capable of obtaining information from diverse respondents regarding their network connections as an asset (e.g. sizes, possessed resources, frequency of connection, trustworthy and reciprocal) through the commonly used paper-and-pencil survey. In addition to total social capital, information specific to bonding capital and bridging capital can be obtained. This instrument is simple to use and well accepted by urban residents, rural residents and rural-to-urban migrants with a minimum of primary school education.

In developing and assessing a measurement instrument, adequate reliability and validity represent two fundamental criteria by which to judge whether a theory-based construct has been successfully translated into a measurement tool [46, 49, 50].

Findings from this study have indicated that the Personal Social Capital Scale is reliable and valid. The high Cronbach alpha (0.77–0.87), the consistent item-total correlation, the successful CFA modeling and the significant associations of the scale-measured social capital with a number of theoretically related variables indicate adequate reliability and validity of the instrument.

Limitations

The test–retest reliability of the instrument was not assessed. Despite adequate internal consistency and high reliability (Cronbach alpha > 0.8), assessing the reliability of the instrument across time intervals will require further research using data collected at different time points. In addition, the lack of published instruments, which might serve as 'gold standards', does not permit assessment of the validity of this instrument against validated instruments.

Conclusion

The Personal Social Capital Scale we developed and assessed in this study adds a new tool for survey studies to quantitatively assess personally owned social capital, including bonding and bridging social capital. The application of the tool will facilitate research in assessing the role of social capital in affecting people's behavior and health and in evaluating the effect of intervention programs that include a social capital component for behavior changes.

Supplementary data

The Chinese version of the Personal Social Capital Scale can be viewed as supplementary data at *Health Education Research* online.

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Appendix. Personal Social Capital Scale

1. *English version* (The Chinese version can be viewed as supplementary data at *Health Education Research* online)

Cap1. How do you rate the number of people in each of the following six categories?	A lot	More than average	Average	Less than average	A few
Your family members	5	4	3	2	1
Your relatives	5	4	3	2	1
People in your neighborhood	5	4	3	2	1
Your friends	5	4	3	2	1

Appendix *Continued*

Your coworkers/fellows	5	4	3	2	1
Your country fellows/old classmates	5	4	3	2	1
Cap2. With how many of people in each of the following categories do you keep a routine contact?	All	Most	Some	Few	None
Your family members	5	4	3	2	1
Your relatives	5	4	3	2	1
People in your neighborhood	5	4	3	2	1
Your friends	5	4	3	2	1
Your coworkers/fellows	5	4	3	2	1
Your country fellows/old classmates	5	4	3	2	1
Cap3. Among the people in each of the following six categories, how many can you trust?	All	Most	Some	Few	None
Your family members	5	4	3	2	1
Your relatives	5	4	3	2	1
People in your neighborhood	5	4	3	2	1
Your friends	5	4	3	2	1
Your coworkers/fellows	5	4	3	2	1
Your country fellows/old classmates	5	4	3	2	1
Cap4. Among people in each of the following six categories, how many will definitely help you upon your request?	All	Most	Some	A few	None
Your family members	5	4	3	2	1
Your relatives	5	4	3	2	1
People in your neighborhood	5	4	3	2	1
Your friends	5	4	3	2	1
Your coworkers/fellows	5	4	3	2	1
Your country fellows/old classmates	5	4	3	2	1
Cap5. When people in all the six categories are considered, how many possess the following assets/resources?	All	Most	Some	Few	None
Certain political power	5	4	3	2	1
Wealth or owners of an enterprise or a company	5	4	3	2	1
Broad connections with others	5	4	3	2	1
High reputation/influential	5	4	3	2	1
With high school or more education	5	4	3	2	1
With a professional job	5	4	3	2	1
Cap6. How do you rate the number of the following two types of groups/organizations in your community?	A lot	More than average	Average	Less than average	A few
Governmental, political, economic and social groups/organizations (political parties, women's groups, village committees, trade union, cooperate associations, volunteer groups, etc)	5	4	3	2	1
Cultural, recreational and leisure groups/organizations (religious, country fellows, alumni, sport, music, dances, crafts, games, etc)	5	4	3	2	1
Cap7. Do you participate in activities for how many of each of these two types of groups and organizations?	All	Most	Some	A few	None
Governmental, political, economic and social groups/organizations (political parties, women's groups, village committees, trade union, cooperate associations, volunteer groups, etc)	5	4	3	2	1
Cultural, recreational and leisure groups/organizations (religious, country fellows, alumni, sport, music, dances, crafts, games, etc)	5	4	3	2	1

Appendix *Continued*

Cap8. Among each of the two types of groups and organizations, how many represent your rights and interests?	All	Most	Some	A few	None
Governmental, political, economic and social groups/organizations (political parties, women's groups, village committees, trade union, cooperate associations, volunteer groups, etc)	5	4	3	2	1
Cultural, recreational and leisure groups/organizations (religious, country fellows, alumni, sport, music, dances, crafts, games, etc)	5	4	3	2	1
Cap9. Among each of the two types of groups and organizations, how many will help you upon your request?	All	Most	Some	A few	None
Governmental, political, economic and social groups/organizations (political parties, women's groups, village committees, trade union, cooperate associations, volunteer groups, etc)	5	4	3	2	1
Cultural, recreational and leisure groups/organizations (religious, country fellows, alumni, sport, music, dances, crafts, games, etc)	5	4	3	2	1
Cap10. When all groups and organizations in the two categories are considered, how many possess the following assets/resources?	All	Most	Some	A few	None
Significant power for decision making	5	4	3	2	1
Solid financial basis	5	4	3	2	1
Broad social connections	5	4	3	2	1
Great social influence	5	4	3	2	1