

Convergent and factorial validation of the Service Leadership Behavior Scale

**Daniel TL Shek^{1-6,*}, PhD, FHKPS, BBS,
SBS, JP, Lawrence K Ma¹, PhD,
Cecilia MS Ma¹, PhD,
and A Reza Hoshmand⁷, PhD**

¹Department of Applied Social Sciences, The Hong Kong Polytechnic University, Hong Kong, PR China

²Centre for Innovative Programmes for Adolescents and Families, The Hong Kong Polytechnic University, Hong Kong, PR China

³Department of Social Work, East China Normal University, Shanghai, PR China

⁴Kiang Wu Nursing College of Macau, Macau, PR China

⁵Hong Kong Institute of Service Leadership and Management Limited, Hong Kong, PR China

⁶Division of Adolescent Medicine, Department of Pediatrics, Kentucky Children's Hospital, University of Kentucky School of Medicine, Lexington, Kentucky, USA

⁷General Education Office, Hong Kong Baptist University, Hong Kong, PR China.

Abstract

Utilizing a sample of 4,486 Hong Kong undergraduates recruited from eight government-funded universities, this paper reports the findings of a cross-institution validation study on the Service Leadership Behavior Scale (Short-Form) with 65 items (SLB-SF-65). Specifically, we examined the internal consistency, convergent validity, as well as the dimensionality of the SLB-SF-65. Results of the exploratory factor analysis indicated that six factors could be extracted with 48 items retained in the trimmed version of the scale (SLB-SF-48) with a stable factor structure. Besides, the overall scale showed excellent internal consistency and was positively correlated to a myriad of theoretically relevant constructs. In short, the present findings underscored the adequacy of the trimmed Service Leadership Behavior Scale (SLB-SF-48) as an objective assessment to gauge whether one possesses the behavioral qualities of a Service Leader.

Keywords: Service Leadership Behavior Scale, exploratory factor analysis, convergent validity, Service Leadership education, scale validation

Introduction

As an emergent leadership paradigm in advanced economies (1,2), the Service Leadership paradigm, contrary to the traditional elitist leadership models, contends that leadership success should extend beyond discipline-oriented knowledge or task-specific competencies (i.e., the “hard (or *product*) skills”) to cover “soft (or *process*) skills” including interpersonal communication and intrapersonal qualities (3,4). As Shek and colleagues (5) remarked, such a paradigm which “calls for leaders with qualities to serve others” (p. 164) and inspires a revamp in leadership initiative, informs education and research which are instrumental to Hong Kong where service takes up a whopping 92.2% of GDP (6). As such, Po Chung, Chairman of the Hong Kong Service Leadership and

* **Correspondence:** Daniel TL Shek, PhD, FHKPS, BBS, SBS, JP, Associate Vice President (Undergraduate Programme), Chair Professor of Applied Social Sciences and Li and Fung Professor in Service Leadership Education, Department of Applied Social Sciences, The Hong Kong Polytechnic University, Hunghom, Hong Kong, PR China. E-mail: daniel.shek@polyu.edu.hk

Management Limited (HKI-SLAM), initiated the notion of Service Leadership education targeting university students of Hong Kong (i.e., SLAM framework).

With the financial support of the Victor and William Fung Foundation and the collaborative effort of the HKI-SLAM and the government, a multi-year project entitled the “Fung Service Leadership Education Initiative” was implemented in eight government-funded universities. On the basis of the SLAM framework, each participating institution would design her own curriculum aimed to promote students’ Service Leadership attributes (see 7). Specifically, Po Chung highlighted Competence (i.e., “Doing things right”), Moral character (i.e., “Doing the right things”), and Caring disposition (i.e., “Serving with unselfish intent”) as the three defining attributes in building a leader’s legitimacy and thereby contributing to leadership success (8,9). Hence, the formula “E (Effective leadership) = M (Moral character) C² (Competence * Caring)” laid the conceptual foundation for the model of Service Leadership education (10).

To objectively assess qualities of effective Service Leaders (11), the research team at The Hong Kong Polytechnic University (PolyU) initiated a project entitled “Development and validation of measures based on the Service Leadership Model (“The Project” hereafter)” (5). Via developing and validating three scales on attitude, behavior, and knowledge corresponding to the three dimensions argued to define the educational success of Service Leadership (12), Shek and colleagues (5) endeavored to develop reliable and valid assessment tools to judge whether an individual is a good Service Leader. In this paper, findings of a large-scale validation study of the Short-Form of Service Leadership Behavior Scale (SLB-SF-65) are reported.

The long-form Service Leadership Behavior Scale (SLB-LF-97) was developed to measure the “behavioral qualities a Service leader should demonstrate” (5, p. 165). Operating on a six-point Likert Scale (1: very dissimilar; 6: very similar), the SLB-LF-97 includes 97 items developed based on the SLAM framework, 25 principles of Service Leadership (8), and the leadership literature (e.g., 13-15). These 97 items cover four main dimensions, including i) service provision, ii) principle “E = MC²”, iii)

commitment to continuous improvement, and iv) distributed leadership.

As part of “The Project” (see 5), a validation study involving 231 PolyU undergraduates was conducted in November 2016 to examine the psychometric properties and factorial structures of the 97-item SLB-LF-97. The results highlighted the excellent reliability of the SLB-LF-97 ($\alpha = 0.97$) and its moderate to strong correlations (r s ranging from 0.51 to 0.81) with several theoretically relevant constructs including Servant Leadership (16), empathy (17), moral self-concept (18), and leadership efficacy (19,20). Meanwhile, findings of the exploratory factor analysis (EFA) suggested the removal of 32 items due to double-loading (21) and insufficient-loading issues (i.e., loadings less than 0.40) (see 22). Ultimately, 65 items were retained to form the Short-Form of the Service Leadership Behavior Scale (SLB-SF-65).

While the above unpublished study pioneered the convergent validation and the analysis of the dimensionality of the initial behavior scale (i.e., SLB-LF-97), there is a need to replicate the psychometric soundness and to re-examine the dimensionality of the trimmed scale using on a larger sample. As the main body of “The Project,” the present study utilized a sample of 4,486 undergraduates to examine the item homogeneity, convergent and factorial validity of the 65-item SLB-SF-65. Specifically, this paper is mainly focused on reporting the results of the EFA, in addition to analyses of the internal consistency and convergent validity of the SLB-SF-65.

Methods

Utilizing an e-platform, a total of 4,486 undergraduates (mean age: 20.47 years; SD: 1.67) from eight government-funded universities participated in the Service Leadership Scales validation study. Amongst the 4,486 respondents, 1,517 (33.8%) were males and 2,969 (66.2%) were females. An overwhelming proportion of the participants were aged 20 to 24 years (68.4%), had neither received any credit-bearing (74.3%) nor non-credit-bearing (82.0%) training in Service Leadership, despite the fact that 64.4% had formerly served as a leader (such as being the chairperson of a student association). Furthermore, 77.1% sat the Hong Kong Diploma of Second-

ary Education Examination (HKDSE). Details regarding other demographic information of the present working sample are addressed in another paper within this special issue.

Procedures

The data collection, which commenced on March 2017, was implemented via the mySurvey@PolyU electronic survey system. The research objectives, instructions on how to complete the present self-administered survey, participants’ rights to voluntarily participate and withdraw, and the principle of data confidentiality were highlighted in the invitation documents and on the survey webpage. Participants were also informed that 45 to 60 minutes would be warranted to conscientiously complete the entire questionnaire. Students’ informed consent was obtained at the start of the e-survey. By the completion of the study, each participant was entitled to a supermarket cash coupon valued at HK\$100 (US\$12.80).

Participants’ completed responses were downloaded as an EXCEL file for a data-cleaning process before the conversion to an SPSS file for statistical analyses. Details on the various steps taken and criteria as regards the eligibility of the responses were reported in another paper in this issue. Ultimately, 4,486 cases were considered eligible for further analyses.

Instruments

The present e-survey was composed of items from the Short-Forms of the Service Leadership scales, including i) the Service Leadership Attitude Scale (SLA-SF-73; 73 items), ii) the Service Leadership Behavior Scale (SLB-SF-65; 65 items), and iii) the Service Leadership Knowledge Scale (SLK-SF-50; 50 items). The present paper is primarily concerned with the validation of the 65-item Service Leadership Behavior Scale (SLB-SF-65).

Developed based on the SLAM framework, 25 principles of Service Leadership (8), and other published works on *leadership* (e.g., 15,23), the 97-item Service Leadership Behavior Scale (i.e., SLB-LF-97) was constructed to examine the extent to which an individual demonstrates behaviors that are representative of a Service Leader. Sixty-five items were ultimately retained to form the SLB-SF-65, following an unpublished validation study involving 231 PolyU undergraduates as part of the project “Development and validation of measures based on the Service Leadership Model” (see 5). The SLB-SF-65, which is in English with a six-point Likert Scale (1: very dissimilar; 6: very similar), describes some leaders’ behaviors whereby participants rate how each description resembles their behaviors if they are in a position to lead. Table 1 features four sample items of the SLB-SF-65.

Table 1. Four sample items of the SLB-SF-65

Items	Very Dissimilar to Me	Moderately Dissimilar to Me	Slightly Dissimilar to Me	Slightly Similar to Me	Moderately Similar to Me	Very Similar To Me
15. I trust myself in tackling difficulties in my life.	1	2	3	4	5	6
36. I have no problem letting others know my shortcomings.	1	2	3	4	5	6
49. I can motivate myself to achieve any goals I set.	1	2	3	4	5	6
64. I impose total control over duties assigned to other individuals. (Reverse-item)	1	2	3	4	5	6

Note. All sample items were slightly re-worded due to copyright issues.

Four other validated scales as listed below from the leadership and personality literature were also administered, with the aim of ascertaining the convergent validity of the SLA-SF-73, the SLB-SF-65, and the SLK-SF-50. These validated external inventories included the 20-item Revised Servant Leadership Profile (RSLP), the 8-item Leadership Efficacy Scale (LEF), the 8-item Moral Self-Concept Scale (MSC), plus 14 items selected from Interpersonal Reactivity Index (IRI). There were also forced-choice and open-ended items aimed to measure the respondents' demographics.

1. **Revised Servant Leadership Profile (RSLP):** The RSLP was developed by Wong and Page (24) to assess the multidimensional construct *Servant Leadership*. In this study, 20 items from five dimensions deemed relevant to the SLAM curriculum—including, i) *Empowering and developing others* (five items), ii) *Serving others* (seven items), iii) *Open, participatory leadership* (two items), iv) *Inspiring leadership* (two items), and v) *Integrity and authenticity* (four items)—were included. The RSLP operates on a seven-point Likert scale. A higher score indicates higher likelihood to behave like a *Servant Leader*. Reliability analyses under-scored the high item homogeneity of RSLP ($\alpha = 0.94$; mean inter-item correlations = 0.45).
2. **Leadership Efficacy Scale (LEF):** Developed by Murphy (20), the LEF comprises eight items designed to tap into people's "confidence in their general leadership ability" (19, p. 270). Items were rated on a five-point Likert scale, with a higher score symbolizing one's perceived capability to take on a leadership role. Reliability analyses demonstrated an acceptable internal consistency amongst the eight items ($\alpha = 0.73$; mean inter-item correlations = 0.27).
3. **Moral Self-Concept (MSC):** Developed and validated by Cheng (18) as a subscale under the Chinese Adolescent Self-Esteem Scales (CASES), the MSC, which consists of eight items, examines youngsters' self-appraisal on dimensions pertaining to i) *Conduct and*

virtues, ii) *Self-control and discipline*, and iii) *Altruism*. Items were rated on a seven-point Likert scale, with a higher score indicative of one's value of *morality* to him/herself, which is a cornerstone of effective leadership based on the SLAM curriculum (25). In this study, we adopted the English-translated and slightly amended version of the MSC. Reliability assessment indicated a good internal consistency of the MSC on the current sample ($\alpha = 0.83$; mean inter-item correlations = 0.44).

4. **Interpersonal Reactivity Index (IRI):** Developed by Davis (17) and tested across nations and languages (see 26-28), the IRI is the most widely utilized inventory in assessing empathy as a multidimensional construct (29). The 14 items utilized in the present study were from subscales *Perspective Taking* (PT; seven items) and *Empathic Concern* (EC; seven items). All items were rated on a five-point Likert scale. A higher score, according to Shek and Yu (30), denotes a higher level of empathy which is crucial for effective leadership. Besides computing the component scores for both subscales, a composite IRI score was also calculated. Cronbach's alpha for subscales PT and EC and the composite IRI score were 0.59, 0.62, and 0.74, respectively.

Data analysis plan

We performed both exploratory (EFA) and confirmatory factor analyses (CFA) in the present validation study. SPSS statistics version 24.0 (IBM) was used to perform the EFA, descriptive analyses, and measurement of internal consistency and convergent validity. AMOS 24.0 (IBM) statistical package was utilized to perform the CFA. The present paper is primarily concerned about reporting the findings of the PCA, the internal consistency and convergent validity of the 65-item SLB-SF-65. Details regarding the CFA and the final version of the behavior scale with 38 items will be addressed in another paper under preparation.

To explore the factorial structure of SLB-SF-65, we administered the EFA using the principal component analysis (PCA) with varimax rotation. The aggregate dataset ($N= 4,486$) was split into two random subsets, namely subset A ($N= 2,246$) and subset B ($N= 2,240$). The PCA was performed on subset A to explore the dimensionality of SLB-SF-65, whereby CFA was administered on subset B with the purpose of finalizing a factorial structure of the SLB-SF-65. Meanwhile, to establish the stability of the factorial structure, we performed the identical PCAs on subsets A and B. The Tucker's coefficients of congruence (r_c) were then computed to gauge the resemblance of factor structures across subsets A and B (31,32).

Cronbach's alpha values and item-total correlations were computed to assess the internal consistency of the scale and the individual factor (i.e., subscale) derived. Regarding the assessment of convergent validity, the composite scores—computed via averaging respondents' ratings—of both the scale and the subscales were correlated with the four external criterion measures adopted at present. Since the SLAM curriculum which preaches the behavioral prerequisites of a Service Leader covers domains in *Servant Leadership, leadership efficacy, morality and empathy*, it is logical to hypothesize a positive and significant correlation between the behavior scale (and the subscales) and the i) RSLP, ii) LEF, iii) MSC, and iv) IRI (including subscales EC and PT). Correlational analyses with other Service Leadership scales under validation were also performed. Considering that all these scales were designed to tap into different dimensions (i.e., *knowledge, attitude, and behavior*) of Service Leadership, there is no reason not to expect significant positive correlations amongst the behavior scale (with the subscales) and the validated versions of the SLK-SF-50 and the SLA-SF-73 (and the subscales).

Results

While ten factors were shown to have eigenvalues over unity across the two subsets (see Table 2), visual inspection of both scree plots and consideration of interpretability of the factor solution suggested that six factors which accounted for 53.58% of the total

variance could be retained. Accordingly, the PCA was rerun on subset A specifying the extraction of six factors. The factor loadings of each item, eigenvalues, the percentage of variance explained by each factor, and the correlations amongst the factors and the entire scale are detailed in Table 3.

To assess the stability of this six-factor solution, we computed the coefficients of congruence (r_c) across subsets A ($N= 2,246$) and B ($N= 2,240$). As illustrated in Table 4, the value of r_c of SLB-SF-65 across subsets is 0.99, indicating that the six-factor structure was essentially identical across the two subsets (32). Additionally, the r_c of the six factors across these two random subsamples are all above 0.98 (see Table 4). In short, these findings corroborate the stability of the factors derived (33).

With the objective to simplify and thereby lead to a more stringent interpretability of the factorial structure, 17 items with loadings below 0.50 were removed (34, 35). The resultant 48-item, six-factor solution (SLB-SF-48) was then subjected to a confirmatory factor analysis (CFA), which will be discussed in detail in another paper under preparation. The six factors, each of which forms a subscale, were accordingly named “Self-improvement and Self-reflection” (items 47 to 58), “People and Principles Orientation” (items 1, 32, 37 to 42, 60 to 62, and 65), “Resilience” (items 11 to 13, 15 to 19), “Social Competence” (items 20 to 22, 24 to 27), “Problem-Solving” (items 4 to 9), and “Mentorship” (items 43 to 45).

Reliability of the measures

As detailed in Table 5a, the total scale (SLB-SF-65), trimmed scale (SLB-SF-48) and the subscales all demonstrated at least meritorious internal consistency (i.e., all α values $>.80$, mean inter-item correlations $>.30$) across subsets. Similar findings (i.e., all α values $>.80$, mean inter-item correlations $>.30$) emerged (see Table 5b) even when we further split the two subsamples based on the respondents' gender. All items, except for item 64 which was subsequently excluded from SLB-SF-48, had a corrected item-total correlation of at least 0.40 (see Table 4). Taken together, the present findings supported the high reliability of the SLB-SF-48 and its subscales.

Table 2. Eigenvalues and total variance explained for the analyses on subset A and B

Factors	Subset A (N = 2,246)		Subset B (N = 2,240)	
	Eigenvalues	Total Variance Explained (%)	Eigenvalues	Total Variance Explained (%)
1	23.85	36.69	23.90	36.77
2	2.96	41.25	3.01	41.40
3	2.56	45.18	2.51	45.26
4	2.12	48.44	2.28	48.77
5	1.77	51.17	1.70	51.38
6	1.57	53.58	1.63	53.88
7	1.46	55.82	1.44	56.10
8	1.24	57.73	1.26	58.03
9	1.14	59.48	1.07	59.67
10	1.02	61.05	1.01	61.22
11	0.99	62.58	0.99	62.74

Note. Eigenvalues for the remaining factors are all below unity.

Table 3. Factor loadings of the SLB-SF-65 (N = 2,246)

	M	SD	Component						ITC	Retained for CFA?	Retained after CFA?
			1	2	3	4	5	6			
SLB-01	4.35	0.95	0.020	0.501	0.154	0.118	0.149	0.277	0.49	Yes	Yes
SLB-02	4.15	1.02	-0.036	0.388	0.206	0.091	0.113	0.403	0.44	No	No
SLB-03	4.46	0.88	0.146	0.434	0.131	0.233	0.228	0.232	0.56	No	No
SLB-04	4.39	0.99	0.233	0.168	0.207	0.134	0.666	0.110	0.57	Yes	Yes
SLB-05	4.21	1.01	0.204	0.066	0.253	0.139	0.658	0.225	0.56	Yes	Yes
SLB-06	4.55	0.98	0.237	0.170	0.231	0.110	0.711	0.055	0.58	Yes	Yes
SLB-07	4.52	0.98	0.235	0.181	0.200	0.090	0.765	0.051	0.58	Yes	Yes
SLB-08	4.50	0.99	0.194	0.165	0.148	0.139	0.741	0.083	0.55	Yes	Yes
SLB-09	4.39	0.97	0.184	0.135	0.166	0.216	0.704	0.155	0.57	Yes	No
SLB-10	4.58	0.99	0.241	0.290	0.340	0.228	0.226	-0.079	0.52	No	No
SLB-11	4.13	1.12	0.056	0.120	0.691	0.200	0.131	0.165	0.51	Yes	No
SLB-12	4.13	1.07	0.066	0.116	0.702	0.138	0.215	0.155	0.52	Yes	Yes
SLB-13	4.29	1.04	0.231	0.130	0.563	0.159	0.207	0.213	0.58	Yes	Yes
SLB-14	4.29	0.94	0.240	0.226	0.457	0.048	0.219	0.097	0.52	No	No
SLB-15	4.40	0.97	0.302	0.241	0.529	0.145	0.245	0.099	0.63	Yes	Yes
SLB-16	4.48	0.94	0.365	0.215	0.525	0.181	0.257	0.092	0.66	Yes	Yes
SLB-17	4.41	0.96	0.372	0.182	0.532	0.158	0.202	0.101	0.62	Yes	Yes
SLB-18	4.24	1.04	0.148	0.112	0.652	0.134	0.144	0.165	0.52	Yes	Yes
SLB-19	4.21	1.09	0.157	0.106	0.670	0.190	0.076	0.216	0.54	Yes	Yes
SLB-20	4.61	0.91	0.234	0.316	0.371	0.564	0.043	0.030	0.63	Yes	Yes
SLB-21	4.63	0.89	0.228	0.376	0.281	0.611	0.062	-0.017	0.64	Yes	Yes
SLB-22	4.66	0.90	0.230	0.391	0.212	0.620	0.052	-0.047	0.61	Yes	Yes
SLB-23	4.69	0.92	0.173	0.476	0.101	0.465	0.141	0.014	0.57	No	No
SLB-24	4.48	0.94	0.145	0.283	0.234	0.642	0.120	0.190	0.62	Yes	Yes
SLB-25	4.35	1.00	0.146	0.134	0.193	0.661	0.255	0.292	0.62	Yes	No
SLB-26	4.38	0.96	0.214	0.082	0.186	0.545	0.375	0.275	0.61	Yes	No
SLB-27	4.48	0.95	0.210	0.205	0.145	0.557	0.292	0.142	0.59	Yes	Yes
SLB-28	4.38	0.97	0.236	0.218	0.234	0.336	0.247	0.299	0.60	No	No
SLB-29	4.69	0.93	0.279	0.371	0.161	0.347	0.212	0.108	0.60	No	No
SLB-30	4.69	0.94	0.222	0.461	0.159	0.273	0.113	0.124	0.57	No	No
SLB-31	4.70	0.91	0.331	0.379	0.142	0.400	0.189	0.126	0.64	No	No

	M	SD	Component						ITC	Retained for CFA?	Retained after CFA?
			1	2	3	4	5	6			
SLB-32	4.53	0.94	0.225	<u>0.503</u>	0.157	0.232	0.118	0.205	0.60	Yes	Yes
SLB-33	4.23	0.98	0.111	0.419	0.355	0.070	0.057	0.406	0.56	No	No
SLB-34	4.49	0.90	0.222	0.437	0.295	0.109	0.217	0.288	0.63	No	No
SLB-35	4.25	1.03	0.085	0.385	0.302	0.074	0.068	0.450	0.53	No	No
SLB-36	4.13	1.13	0.062	0.312	0.181	0.086	-0.018	0.420	0.40	No	No
SLB-37	4.71	0.88	0.366	<u>0.553</u>	0.150	0.175	0.114	0.053	0.62	Yes	Yes
SLB-38	4.77	0.89	0.250	<u>0.623</u>	0.042	0.286	0.125	0.053	0.60	Yes	Yes
SLB-39	4.76	0.93	0.248	<u>0.620</u>	0.017	0.273	0.069	0.106	0.58	Yes	No
SLB-40	4.49	1.00	0.132	<u>0.533</u>	0.037	0.247	0.049	0.379	0.56	Yes	Yes
SLB-41	4.68	0.89	0.258	<u>0.569</u>	0.026	0.306	0.065	0.272	0.63	Yes	No
SLB-42	4.68	0.86	0.271	<u>0.534</u>	-0.029	0.310	0.080	0.340	0.62	Yes	Yes
SLB-43	4.36	0.98	0.279	0.240	0.102	0.248	0.209	<u>0.578</u>	0.63	Yes	Yes
SLB-44	4.20	1.05	0.201	0.250	0.113	0.153	0.121	<u>0.711</u>	0.57	Yes	Yes
SLB-45	4.17	1.04	0.223	0.224	0.125	0.130	0.127	<u>0.723</u>	0.57	Yes	Yes
SLB-46	4.32	1.10	0.455	0.002	0.262	0.221	0.070	0.369	0.53	No	No
SLB-47	4.54	0.99	<u>0.615</u>	0.058	0.186	0.254	0.112	0.295	0.61	Yes	No
SLB-48	4.61	0.94	<u>0.615</u>	0.302	0.153	0.150	0.122	0.165	0.65	Yes	Yes
SLB-49	4.48	0.98	<u>0.625</u>	0.040	0.225	0.245	0.136	0.323	0.64	Yes	Yes
SLB-50	4.39	1.03	<u>0.607</u>	0.057	0.236	0.210	0.146	0.324	0.63	Yes	Yes
SLB-51	4.67	0.89	<u>0.660</u>	0.296	0.115	0.171	0.223	0.081	0.67	Yes	Yes
SLB-52	4.65	0.95	<u>0.660</u>	0.303	0.089	0.103	0.167	0.035	0.60	Yes	Yes
SLB-53	4.60	0.92	<u>0.655</u>	0.277	0.091	0.113	0.232	0.094	0.63	Yes	No
SLB-54	4.56	0.96	<u>0.637</u>	0.250	0.104	0.103	0.172	0.116	0.60	Yes	Yes
SLB-55	4.68	0.92	<u>0.637</u>	0.315	0.150	0.122	0.216	0.041	0.65	Yes	Yes
SLB-56	4.72	0.89	<u>0.675</u>	0.306	0.162	0.139	0.175	0.087	0.67	Yes	Yes
SLB-57	4.61	0.92	<u>0.594</u>	0.340	0.178	0.161	0.150	0.113	0.66	Yes	No
SLB-58	4.58	0.95	<u>0.612</u>	0.312	0.193	0.097	0.160	0.125	0.65	Yes	Yes
SLB-59	4.46	0.92	0.445	0.342	0.199	0.146	0.148	0.297	0.65	No	No
SLB-60	4.72	0.89	0.393	<u>0.556</u>	0.185	0.113	0.147	0.067	0.64	Yes	Yes
SLB-61	4.56	0.92	0.315	<u>0.538</u>	0.258	0.037	0.171	0.132	0.62	Yes	No
SLB-62	4.62	0.87	0.278	<u>0.584</u>	0.221	0.048	0.110	0.067	0.58	Yes	Yes
SLB-63	4.43	0.93	0.226	0.462	0.226	0.002	0.149	0.262	0.54	No	No
SLB-64	3.23	1.27	-0.131	0.027	-0.153	0.066	-0.085	-0.543	-0.28	No	No
SLB-65	4.82	0.85	0.362	<u>0.581</u>	0.168	0.101	0.110	0.004	0.59	Yes	Yes
Eigenvalues			23.85	2.96	2.56	2.12	1.78	1.57			
Variance Explained (%)			36.69	4.55	3.93	3.26	2.73	2.41			
Total Variance (%)								53.58			
S1			4.59	0.71							
S2			4.64	0.63	0.72						
S3			4.29	0.76	0.61	0.56					
S4			4.51	0.72	0.63	0.68	0.63				
S5			4.43	0.80	0.59	0.50	0.60	0.55			
S6			4.24	0.90	0.56	0.60	0.51	0.52	0.44		
SLB-SF-65			4.46	0.57	0.87	0.87	0.80	0.82	0.72	0.69	
SLB-SF-48			4.50	0.60	0.88	0.86	0.80	0.82	0.74	0.69	

Note. N = 2,246. M: mean scores; SD: standard deviation. Bold and underlined values are the highest loadings by a variable among the factors which are over 0.50. ITC: item-total correlation. Forty-eight items were retained for the CFA in which 38 items were retained to form the finalized version of the scale. SLB-SF-65: 65-item Short-Form Service Leadership Behavior Scale; SLB-SF-48: the six-factor, 48-item solution to be subjected to CFA. S1: Subscale 1 (12 items, Self-improvement and Self-reflection); S2: Subscale 2 (12 items, People and Principles Orientation); S3: Subscale 3 (8 items, Resilience); S4: Subscale 4 (7 items, Social Competence); S5: Subscale 5 (6 items, Problem-Solving); S6: Subscale 6 (3 items, Mentorship). All correlation coefficients are statistically significant at $p < .001$ (two-tailed).

Table 4. Coefficient of congruence across two subsamples

	Between Two Random Subsamples (Subset A: N = 2,246; Subset B: N = 2,240)
Short-Form Service Leadership Behavior Scale (SLB-SF-65)	0.991
1: <i>Self-Improvement and Self-Reflection</i>	0.996
2: <i>People and Principles Orientation</i>	0.996
3: <i>Resilience</i>	0.989
4: <i>Social Competence</i>	0.982
5: <i>Problem-Solving</i>	0.993
6: <i>Mentorship</i>	0.988

Table 5a. Internal consistencies of SLB-SF-65, SLB-SF-48, and subscales across subsamples

	Entire Sample (N = 4,486)		Subset A (N = 2,246)		Subset B (N = 2,240)	
	α	Mean Inter-Item Correlations	α	Mean Inter-Item Correlations	α	Mean Inter-Item Correlations
SLB-SF-65	0.97	0.34	0.97	0.34	0.97	0.34
SLB-SF-48	0.97	0.38	0.97	0.37	0.97	0.38
1: <i>Self-Improvement and Self-Reflection</i>	0.93	0.53	0.93	0.53	0.93	0.53
2: <i>People and Principles Orientation</i>	0.90	0.44	0.90	0.44	0.91	0.45
3: <i>Resilience</i>	0.88	0.49	0.88	0.48	0.89	0.50
4: <i>Social Competence</i>	0.89	0.54	0.89	0.53	0.90	0.56
5: <i>Problem-Solving</i>	0.89	0.56	0.89	0.59	0.88	0.54
6: <i>Mentorship</i>	0.85	0.65	0.85	0.66	0.85	0.65

Note. α = Cronbach’s alpha value. SLB-SF-65: 65-item Short-Form Service Leadership Behavior Scale; SLB-SF-48: the six-factor, 48-item solution to be subjected to CFA.

Table 5b. Internal consistencies of SLB-SF-65, SLB-SF-48, and subscales across gender

	Subset A (N = 2,246)				Subset B (N = 2,240)			
	Males (N = 775)		Females (N = 1,471)		Males (N = 742)		Females (N = 1,498)	
	α	Mean Inter-Item Correlations	α	Mean Inter-Item Correlations	α	Mean Inter-Item Correlations	α	Mean Inter-Item Correlations
SLB-SF-65	0.97	0.38	0.97	0.32	0.97	0.37	0.97	0.33
SLB-SF-48	0.97	0.42	0.96	0.35	0.97	0.40	0.96	0.36
Subscale 1	0.94	0.56	0.92	0.51	0.93	0.52	0.93	0.53
Subscale 2	0.91	0.45	0.90	0.43	0.92	0.48	0.89	0.41
Subscale 3	0.88	0.48	0.88	0.48	0.88	0.49	0.89	0.51
Subscale 4	0.90	0.55	0.88	0.52	0.90	0.56	0.89	0.55
Subscale 5	0.89	0.57	0.90	0.59	0.87	0.54	0.88	0.54
Subscale 6	0.83	0.62	0.87	0.68	0.84	0.63	0.85	0.66

Note. α = Cronbach’s alpha value. SLB-SF-65: 65-item Short-Form Service Leadership Behavior Scale; SLB-SF-48: the six-factor, 48-item solution to be subjected to CFA. Subscale 1: Self-improvement and Self-reflection; Subscale 2: People and Principles Orientation; Subscale 3: Resilience; Subscale 4: Social competence; Subscale 5: Problem-Solving; Subscale 6: Mentorship.

Validity analyses: Correlation with external criterion scales (and subscales)

Consistent with our hypotheses, correlational findings (see Table 6a) revealed that the SLB-SF-48 scores (and the six subscales) correlated significantly (all $ps < .001$) and positively with all external criterion measures. Using the software package *cocor* (36) which permits comparisons of magnitude between two pairs of correlation coefficients (e.g., Steiger’s (37) computation of z-score using average correlations), the findings (see Table 6b) revealed that amongst all significant correlations, the SLB-SF-48 correlated most robustly with the *Revised Servant Leadership Profile* ($r = 0.790$) and noticeably more modest with the *Interpersonal Reactivity Index* ($r = 0.412$). In summary, these findings shed light on the convergent validity of the SLB-SF-48, which was demonstrated to be positively linked with constructs (e.g., a Servant Leadership mindset and one’s inner urge to uphold morality) theorized to delineate the behavioral prerequisites for a Service Leader (8, 9).

Validity analyses: Correlation with other Service Leadership scales under validation

As Table 7a shows, the SLB-SF-48 correlated significantly and positively with both the composite scores of the single-factor, 40-item Service Leadership Knowledge (i.e., SLK-SF-40) scale ($r = 0.170$), and the eight-factor, 46-item Service Leadership Attitude (i.e., SLA-SF-46) scale ($r = 0.565$). Details about the validation of SLK-SF-40 and SLA-SF-46 are addressed in two separate papers in this special issue. The SLB-SF-48 also correlated positively with most of the subscales of SLA-SF-46. Regarding the six subscales of SLB-SF-48, they are mostly correlated positively and significantly with both the SLK-SF-40 and SLA-SF-46 (including the subscales), despite occasional non-significant or unexpected findings (see Table 7a)

Table 6a. Correlations with external criterion scales (and subscales)

	External Criterion Scales					
	RSLP	MSC	LEF	IRI	IRI-EC	IRI-PT
SLB-SF-65	0.80	0.66	0.51	0.42	0.30	0.45
SLB-SF-48	0.79	0.65	0.53	0.41	0.29	0.43
1: <i>Self-Improvement and Self-Reflection</i>	0.69	0.59	0.42	0.35	0.24	0.39
2: <i>People and Principles Orientation</i>	0.78	0.69	0.37	0.54	0.44	0.51
3: <i>Resilience</i>	0.58	0.41	0.45	0.20	0.10	0.27
4: <i>Social Competence</i>	0.65	0.56	0.52	0.36	0.29	0.34
5: <i>Problem-Solving</i>	0.49	0.37	0.47	0.19	0.10	0.23
6: <i>Mentorship</i>	0.62	0.42	0.40	0.24	0.16	0.27

Note. N = 2,246. All correlation coefficients are statistically significant at $p < .001$ (two-tailed). SLB-SF-65: 65-item Short-Form Service Leadership Behavior Scale; SLB-SF-48: the six-factor, 48-item solution to be subjected to CFA. RSLP: Revised Servant Leadership Profile; MSC: Moral Self-Concept; LEF: Leadership Efficacy; IRI: Interpersonal Reactivity Index; IRI-EC: Subscale “Empathic Concern”; IRI-PT: Subscale “Perspective Taking.”

Table 6b. Comparison of strength of correlations between SLB-SF-48 with the criterion scales

Correlations with the External Criterion Scales (and Subscales)			Z-Scores of Difference between <i>r</i> s (36,37) with SLB-SF-48:				
	α (MITC)	<i>r</i>	MSC	LEF	IRI	IRI-EC	IRI-PT
1. RSLP	0.94 (0.45)	0.790***	14.88***	18.45***	25.32***	29.16***	24.02***
2. MSC	0.83 (0.44)	0.648***	—	7.15***	15.28***	20.14***	13.28***
3. LEF	0.73 (0.27)	0.526***	—	—	5.41***	10.12***	4.44***
4. IRI	0.74 (0.17)	0.412***	—	—	—	12.67***	-2.15*
4a. IRI-EC	0.62 (0.19)	0.293***	—	—	—	—	-7.46***
4b. IRI-PT	0.59 (0.19)	0.433***	—	—	—	—	—

Note. N = 2,246. *p < .05 (two-tailed). ***p < .001 (two-tailed). α Cronbach's alpha value. MITC: Mean inter-item correlations. RSLP: Revised Servant Leadership Profile; MSC: Moral Self-Concept; LEF: Leadership Efficacy; IRI: Interpersonal Reactivity Index; IRI-EC: Subscale "Empathic Concern"; IRI: PT: Subscale "Perspective Taking."

Table 7a. Correlations with other Service Leadership scales (and subscales) under validation

	SLK-SF-40	SLA-SF-46-F1	SLA-SF-46-F2	SLA-SF-46-F3	SLA-SF-46-F4	SLA-SF-46-F5	SLA-SF-46-F6	SLA-SF-46-F7	SLA-SF-46-F8	SLA-SF-46-Total
SLB-SF-65	0.17	0.52	0.48	0.51	0.43	0.47	0.48	0.27	-0.08	0.57
SLB-SF-48	0.17	0.52	0.47	0.50	0.42	0.47	0.47	0.26	-0.07	0.56
1: <i>Self-Improvement and Self-Reflection</i>	0.20	0.48	0.43	0.44	0.37	0.44	0.45	0.21	-0.03	0.52
2: <i>People and Principles Orientation</i>	0.26	0.55	0.55	0.53	0.42	0.54	0.47	0.26	-0.01	0.62
3: <i>Resilience</i>	0.02 ^{n.s.}	0.31	0.27	0.33	0.30	0.26	0.29	0.21	-0.13	0.34
4: <i>Social Competence</i>	0.16	0.43	0.41	0.41	0.32	0.41	0.39	0.22	-0.03 ^{n.s.}	0.47
5: <i>Problem-Solving</i>	0.11	0.36	0.29	0.29	0.23	0.30	0.33	0.13	-0.05*	0.35
6: <i>Mentorship</i>	-0.12	0.24	0.22	0.38	0.38	0.19	0.24	0.24	-0.19	0.30

Note. N = 2,246. * p < .05 (two-tailed). "n.s." denotes statistical non-significance. Unless otherwise specified, all correlation coefficients are significant at p < .001 (two-tailed). SLB-SF-65: 65-item Short-Form Service Leadership Behavior Scale; SLB-SF-48: the six-factor, 48-item solution to be subjected to CFA. SLK-SF-40: Scale score of the single-factor, 40-item Service Leadership Knowledge Scale; SLA-SF-46-Total: Scale score of the eight-factor, 46-item Service Leadership Attitude (SLA) Scale; SLA-SF-46-F1: SLA Factor 1 "Vision and competence"; SLA-SF-46-F2: SLA Factor 2 "People orientation"; SLA-SF-46-F3: SLA Factor 3 "Caring disposition"; SLA-SF-46-F4: SLA Factor 4 "Ethical role model"; SLA-SF-46-F5: SLA Factor 5 "Social competence"; SLA-SF-46-F6: SLA Factor 6 "Self-understanding and reflection"; SLA-SF-46-F7: SLA Factor 7 "Positive view about human beings"; SLA-SF-46-F8: SLA Factor 8 "Unchangeable and dark human nature."

Table 7b. Comparison of strength of correlations between SLB-SF-48 and other Service Leadership scales under validation

Correlations with the External Criterion Scales (and Subscales)			Z-Scores of Difference between <i>r</i> s (36,37) with SLB-SF-48 ^a								
	α (MITC)	<i>r</i>	SLA-SF-46-F1	SLA-SF-46-F2	SLA-SF-46-F3	SLA-SF-46-F4	SLA-SF-46-F5	SLA-SF-46-F6	SLA-SF-46-F7	SLA-SF-46-F8	SLA-SF-46-Total
1. SLK-SF-40	0.94 (0.28)	0.170***	-15.56	-13.63	-13.40	-9.21	-13.61	-12.58	-3.23	10.53	-18.99
2. SLA-SF-46-F1	0.90 (0.46)	0.515***	—	3.46	1.08 ^{n.s.}	5.47	3.86	3.02	11.07	20.88	-5.68
3. SLA-SF-46-F2	0.87 (0.47)	0.474***	—	—	-1.60 ^{n.s.}	2.93	0.50 ^{n.s.}	0.23 ^{n.s.}	9.60	19.57	-9.65
4. SLA-SF-46-F3	0.86 (0.46)	0.499***	—	—	—	5.39	2.04	1.74 ^{n.s.}	10.96	19.33	-5.98
5. SLA-SF-46-F4	0.85 (0.53)	0.419***	—	—	—	—	-2.57	-2.69	6.91	15.53	-10.23
6. SLA-SF-46-F5	0.84 (0.57)	0.467***	—	—	—	—	—	-0.17 ^{n.s.}	8.83	19.50	-9.50
7. SLA-SF-46-F6	0.82 (0.49)	0.470***	—	—	—	—	—	—	8.50	18.10	-7.13
8. SLA-SF-46-F7	0.70 (0.54)	0.261***	—	—	—	—	—	—	—	11.47	-15.37
9. SLA-SF-46-F8	0.78 (0.41)	-0.068**	—	—	—	—	—	—	—	—	-25.12
10. SLA-SF-46-Total	0.94 (0.28)	0.565***	—	—	—	—	—	—	—	—	—

Note. N = 2,246. *** $p < .001$ (two-tailed). α = Cronbach's alpha value. MITC: Mean inter-item correlations. ^aUnless otherwise specified by the superscript "n.s." which denotes statistical non-significance, all other Z-scores of difference were significant at $p < .05$ (two-tailed) (i.e., $|Z\text{-score}| > 1.96$). SLK-SF-40: Scale score of the single-factor, 40-item Service Leadership Knowledge Scale; SLA-SF-46-Total: Scale score of the eight-factor, 46-item Service Leadership Attitude (SLA) Scale; SLA-SF-46-F1: SLA Factor 1 "Vision and competence"; SLA-SF-46-F2: SLA Factor 2 "People orientation"; SLA-SF-46-F3: SLA Factor 3 "Caring disposition"; SLA-SF-46-F4: SLA Factor 4 "Ethical role model"; SLA-SF-46-F5: SLA Factor 5 "Social competence"; SLA-SF-46-F6: SLA Factor 6 "Self-understanding and reflection"; SLA-SF-46-F7: SLA Factor 7 "Positive view about human beings"; SLA-SF-46-F8: SLA Factor 8 "Unchangeable and dark human nature".

Additionally, comparison of the strengths of correlation (see Table 7b) revealed that the strengths of associations between SLB-SF-48 and SLA-SF-46 (including the subscales) were, in general, significantly greater ($ps < .05$) than that of SLB-SF-48 and SLK-SF-40. These results indicated that the display of Service Leadership behaviors would be linked more to whether someone is prone to think or feel (i.e., attitude) like a Service Leader than him/her being more “book-smart” (i.e., knowledge) in the SLAM curriculum.

Discussion

Utilizing a large sample of Hong Kong undergraduates, the present study attempted to validate the Short-Form Service Leadership Behavior Scale. The findings underlined the excellent reliability amongst the items. Results of the EFA suggested a six-factor solution which was demonstrated to be stable across sub-samples, hence providing support for the factorial validity of the 48-item Service Leadership Behavior Scale (SLB-SF-48). Besides, the six subscales were found to correlate significantly and positively with all external criterion measures. The SLB-SF-48 and subscales, which recorded excellent internal consistencies, were also demonstrated to correlate positively and significantly with the two other Serviced Leadership scales. These results provide support for the convergent validity of SLB-SF-48. Taken together, the present analyses lend support to the legitimacy of SLB-SF-48 as a valid and reliable rubric to judge whether someone demonstrated qualities characteristic of a good Service Leader.

There are several contributions of the present paper. First, in view of the lack of leadership assessment tools in the Chinese context, this is an important addition to the literature. As Chinese people constitute roughly one-fifth of the world’s population, objective leadership scales for Chinese people need to be developed. Second, the present findings are important for the Service Leadership literature. As the ever-expanding global economy becomes more service-oriented, this is a timely effort to develop objective tools in this area. Third, the scale permits an objective assessment of Service Leadership behavior which is important for personnel decisions.

Employers may wish to employ workers capable of exhibiting Service Leadership behaviors. Fourth, the scale can be used by researchers to evaluate the effectiveness of Service Leadership training programs. Basically, if a training program works, the trainees should show positive changes after completion of the program. Finally, the scale can enable an individual to understand oneself more regarding his/her attributes in Service Leadership.

While the current paper may have underscored the psychometric soundness and factorial stability of SLB-SF-48, there are still aspects which warrant addressing. First, this paper focuses only on the exploratory side of the dimensionality assessment of the behavior scale. While an interpretable and stable initial factorial solution has been established, to further quantify and accordingly, ascertain the absolute and relative agreement (i.e., the fit indices) of this six-factor solution with the response data, it is imperative that a confirmatory factor analysis (CFA) be administered (38). Due to the limitation of word count in this special issue, the present article is unable to also report the CFA which had been conducted as part of this large-scale validation study. As reiterated throughout this paper, the findings of the CFA would be detailedly discussed in another paper under preparation.

Second, the *Knowledge-Behavior* link ($r = 0.17$) was noticeably weaker compared to the *Attitude-Behavior* association ($r = 0.56$), implying a disconnect between one’s *understanding* and propensity to *practice* in relation to the SLAM curriculum. This may be attributable to the varying nature of different Service Leadership surveys. Unlike the knowledge scale which has a “correct” answer for every item, the behavior and attitude scales are more like an opinion poll. It is, therefore, conceivable that respondents in behavior and attitude scales may respond according to their *personal* or *normative theory* rather than their *genuine stances* on the matter (39). Social desirability responding may also come into the equation (40). In other words, instead of indicating whether he/she had previously demonstrated a certain behavioral quality of a Service Leader, a participant may have responded based on what he/she believes a Service Leader *should* do in this situation, or alternatively, he/she may have tried to rate in a particular fashion that presents him/her in a favorable light (41).

In spite of all these shortcomings, this paper does not only evidence the internal consistency and convergent validity of the SLB-SF-65, but also informs the “rightsizing” of the scale (accordingly forming the SLB-SF-48) which has been well-documented to promote response rate and minimize response burden (see 42 for a review). As systematic evaluation research in the context of Service Leadership education remains scanty (7,12), the present paper constitutes a valuable addition to the literature by presenting a pioneer assessment tool in behavioral qualities of Service Leadership which was demonstrated to be valid and reliable.

Acknowledgments

The validation project is financially supported by the Victor and William Fung Foundation. The preparation for this paper is supported by the Foundation and the Endowed Professorship in Service Leadership Education at The Hong Kong Polytechnic University.

Ethical compliance

The authors have stated all possible conflicts of interest within this work. The authors have stated all sources of funding for this work. If this work involved human participants, informed consent was received from each individual. If this work involved human participants, it was conducted in accordance with the 1964 Declaration of Helsinki. If this work involved experiments with humans or animals, it was conducted in accordance with the related institutions’ research ethics guidelines.

References

- [1] Hoshmand AR. The role of service leadership in the university's GE curriculum: The HKBU experience. In: Shek DTL, Chung PPY, eds. *Promoting Service Leadership qualities in university students: The case of Hong Kong*. Singapore: Springer, 2015:17-28.
- [2] Snell RS, Chan MYL, Zou TXP. Key practices of leadership for service in Hong Kong. In: Shek DTL, Chung PPY, Lin L, Merrick J, eds. *Service Leadership education for university students*. New York: Nova Science, 2017:127-38.
- [3] Chung PPY. *Service reborn: The knowledge, skills, and attitudes of service companies*, 1st ed. New York: Lexington Publishing, 2012.
- [4] Shek DTL, Chung PPY, Leung H. Manufacturing economy vs. service economy: Implications for Service Leadership. *Int J Disabil Hum Dev* 2015;14:205-15.
- [5] Shek DTL, Lin L, Leung H, Yu L, Ma CMS, Li X. Development and validation of the Service Leadership Knowledge Scale in a Chinese context. In: Shek DTL, Chung PPY, Lin L, Merrick J, eds. *Service leadership education for university students*. New York: Nova Science, 2017:163-88.
- [6] Census and Statistics Department. *Hong Kong monthly digest of statistics: The four key industries and other selected industries in the Hong Kong economy*. Hong Kong: Census and Statistics Department, 2017.
- [7] Shek DTL, Chung PPY, eds. *Promoting service leadership qualities in university students: The case of Hong Kong*. Singapore: Springer, 2015.
- [8] Chung PPY, Bell AH. *25 Principles of service leadership*, 1st ed. New York: Lexington, 2015.
- [9] Chung PPY, Elfassy R. *The 12 dimensions of a service leader*, 1st ed. New York: Lexington, 2016.
- [10] Shek DTL, Yu L, Ma CMS, Sun RCF, Liu TT. Development of a credit-bearing service leadership subject for university students in Hong Kong. *Int J Adolesc Med Health* 2013;25:353-61.
- [11] Shek DTL, Lin L. Evaluating Service Leadership programs with multiple strategies. In: Shek DTL, Chung PPY, eds. *Promoting Service Leadership qualities in university students: The case of Hong Kong*. Singapore: Springer, 2015:197-211.
- [12] Shek DTL, Lin L. Validation of the Service Leadership Knowledge Scale: Criterion-related validity. In: Shek DTL, Chung PPY, Lin L, Merrick J, eds. *Service leadership education for university students*. New York: Nova Science, 2017:189-204.
- [13] Grant AM, Franklin J, Langford P. The self-reflection and insight scale: A new measure of private self-consciousness. *Soc Behav Pers* 2002;30:821-35.
- [14] Page D, Wong PTP. A conceptual framework for measuring servant leadership. In: Adjibolooso SBSK, ed. *The human factor in shaping the course of history and development*. Lanham, MD: University Press of America, 2000:69-110.
- [15] Wielkiewicz RM. The Leadership Attitudes and Beliefs Scale: An instrument for evaluating college students' thinking about leadership and organizations. *J Coll Stud Dev* 2000;41:335-47.
- [16] Greenleaf RK. *Servant leadership: A journey into the nature of legitimate power and greatness*. New York: Paulist Press, 1977.

- [17] Davis MH. Measuring individual differences in empathy: Evidence for a multidimensional approach. *J Pers Soc Psychol* 1983;44:113-26.
- [18] Cheng CHK. *The Chinese Adolescent Self-Esteem Scales (CASES): A user manual*. Hong Kong: City University of Hong Kong Press, 2005.
- [19] Chemers MM, Watson CB, May ST. Dispositional affect and leadership effectiveness: A comparison of self-esteem, optimism, and efficacy. *Pers Soc Psychol Bull* 2000;26:267-77.
- [20] Murphy SE. *The contribution of leadership experience and self-efficacy to group performance under evaluation apprehension*. Dissertation. Seattle: WA: University of Washington, 1992.
- [21] Mullin EM. Scale development: Heterosexist attitudes in women's collegiate athletics. *Meas Phys Educ Exerc Sci* 2013;17:1-21.
- [22] Field A. *Discovering statistics using IBM SPSS statistics*, 4th ed. London: SAGE, 2013.
- [23] King DB, DeCicco TL. A viable model and self-report measure of spiritual intelligence. *Int J Transpersonal Stud* 2009;28:68-85.
- [24] Wong PTP, Page D. *Servant leadership: An opponent-process model and the Revised Servant Leadership Profile*. Virginia Beach, VA: Regent University, 2003.
- [25] Shek DTL, Lin L. Core beliefs in the service leadership model proposed by the Hong Kong Institute of Service Leadership and Management. *Int J Disabil Hum Dev* 2015;14:233-42.
- [26] de Corte K, Buysse A, Verhofstadt LL, Roeyers H, Ponnet K, Davis MH. Measuring empathic tendencies: Reliability and validity of the Dutch version of the Interpersonal Reactivity Index. *Psychol Belg* 2007; 47:235-60.
- [27] Fernández AM, Dufey M, Kramp U. Testing the psychometric properties of the Interpersonal Reactivity Index (IRI) in Chile: Empathy in a different cultural context. *Eur J Psychol Assess* 2011;27:179-85.
- [28] Siu AMH, Shek DTL. Validation of the Interpersonal Reactivity Index in a Chinese context. *Res Soc Work Pract* 2005;15:118-26.
- [29] Shamay-Tsoory SG, Aharon-Peretz J, Perry D. Two systems for empathy: a double dissociation between emotional and cognitive empathy in inferior frontal gyrus versus ventromedial prefrontal lesions. *Brain* 2009;132:617-27.
- [30] Shek DTL, Yu L. General University Requirements and holistic development in university students in Hong Kong. *Int J Adolesc Med Health* 2017;29:41-8.
- [31] Armenakis AA, Feild HS, Wilmoth JN. An algorithm for assessing factor structure congruence. *Educ Psychol Meas* 1977;37:213-4.
- [32] Lorenzo-Seva U, ten Berge JMF. Tucker's congruence coefficient as a meaningful index of factor similarity. *Methodology (Gott)* 2006;2:57-64.
- [33] Shek DTL, Yu L. Factorial validity of a subjective outcome evaluation tool for implementers of a positive youth development program. *J Pediatr Adolesc Gynecol* 2014;27:S32-42.
- [34] Jamal AAA, Ramlan WK, Karim MRA, Mohidin R, Osman Z. The effects of social influence and financial literacy on savings behavior: A study on students of higher learning institutions in Kota Kinabalu, Sabah. *Int J Bus Manag Soc Res* 2015;6:110-9.
- [35] Milan GS, da Silva MBC, Bebbler S. Analysis of attributes and dimensions of the built environment quality from the perspective of employees from furniture companies. *Braz Bus Rev* 2015;12:66-86.
- [36] Diedenhofen B, Musch J. cocor: A comprehensive solution for the statistical comparison of correlations. *PLoS ONE* 2015;10:e0121945. doi:10.1371/journal.pone.0121945.
- [37] Steiger JH. Tests for comparing elements of a correlation matrix. *Psychol Bull* 1980;87:245-51.
- [38] Cohen RJ, Swerdlik ME. *Psychological testing and assessment: An introduction to tests and measurement*, 6th ed. New York: McGraw-Hill, 2005.
- [39] Weiner B, Russell D, Lerman D. The cognition-emotion process in achievement-related contexts. *J Pers Soc Psychol* 1979;37:1211-20.
- [40] van de Mortel TF. Faking it: Social desirability response bias in self-report research. *Aust J Adv Nurs* 2008; 25:40-8.
- [41] Shek DTL, Leung JTY, Ma LK, Lin L, Wu FKY. Training of potential program implementers for the Tin Ka Ping P.A.T.H.S. Project in China: Subjective outcome evaluation findings. *Int J Child Adolesc Health*, in press.
- [42] Edwards P, Roberts I, Clarke M, DiGiuseppi C, Pratap S, Wentz R, et al. Increasing response rates to postal questionnaires: Systematic review. *BMJ* 2002;324: 1183-5.

Submitted: April 12, 2018. *Revised:* May 05, 2018.
Accepted: May 12, 2018.

Copyright of International Journal of Child & Adolescent Health is the property of Nova Science Publishers, Inc. and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.