

Psychometric Properties and Measurement Invariance of the Arabic Version of the Flourishing Scale

Saeed Abdullah AL-Dossary¹

¹ Psychology Department, College of Education, University of Ha'il, Ha'il, Saudi Arabia

Correspondence: Saeed AL-Dossary, Psychology Department, College of Education, University of Ha'il, Ha'il P.O. Box 1818, Saudi Arabia.

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Abstract

The flourishing Scale (FS) is a measure of overall life well-being. The aim of the study was to assess the psychometric properties and measurement invariance of the Arabic version of the FS in the Saudi Arabian context. Data was collected from two samples: 969 students at two universities and 299 full-time employees working in multiple sectors. Internal consistency of the FS was examined by calculating Cronbach's alpha coefficient to test reliability. To evaluate convergent and discriminant validity, the FS was compared with other measures of well-being, happiness, and depression. In order to examine the factor structure and the measurement invariance of the FS across study samples, confirmatory factor analysis and multi-group confirmatory factor analysis were performed. The FS showed good internal reliability as well as convergent and discriminant validity. Results also provided support for a one-factor and an invariant structure of the FS. Taken together, these results suggest that the FS Arabic version is a reliable and valid measure for the Arabic cultural context.

Keywords: positive psychology, flourishing scale, psychological well-being, measurement invariance, subjective well-being, psychometric properties

1. Introduction

Psychology has traditionally mostly focused on illnesses and negative sides of human life and experiences such as fear, depression, and learning disability (Seligman & Csikszentmihalyi, 2000). Nevertheless, in neoteric decades, the focus has changed to positive psychology, which examines the positive sides of human life and experiences. A central focus of positive psychology is the concept of well-being (Keyes, Shmotkin, & Ryff, 2002; Seligman, 2011). It is a complex, multifaceted concept and has been defined and measured in the literature from two theoretical perspectives, namely hedonic and eudemonic well-being (Ryan & Deci, 2001). The hedonic perspective, frequently known as subjective well-being (SWB), focuses on subjective happiness with pleasure and enjoyment (Waterman, 2008), and therefore defined well-being basically with regards to gratification achievement and pain avoidance. However, eudemonic perspective, also referred to as psychological well-being (PWB), argues that well-being is more than just happiness, and deems self-realization, meaning in life, and personal growth, to be essential for well-being (Ryan & Deci, 2001).

Different scales of well-being established on these two perspectives have been developed (Diener, Oishi, & Lucas, 2003). For example, scales frequently used to evaluate hedonic view involving the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985), the Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988), and the Subjective Happiness Scale (Lyubomirsky & Lepper, 1999). Most widely used scales established on the eudemonic belief involving the Scales of Psychological Well-Being (Ryff & Keyes, 1995) and the Basic Needs Satisfaction Scale (Ryan & Deci, 2001). Recent efforts have found that well-being can be best conceptualized as a multidimensional phenomenon that covers aspect of both perspectives of well-being (Deci & Ryan, 2008). Based on these efforts, Diener et al. (2010) created a new measure titled the Flourishing Scale (FS).

The FS has been validated in different contexts and translated into various languages around the world, including Chinese (Duan & Xie, 2019; Tang, Duan, Wang, & Liu, 2016; Tong & Wang, 2017), Dutch (Schotanus-Dijkstra et al., 2016), French (Villieux, Sovet, Jung, & Guilbert, 2016), Italian (Giuntoli, Ceccarini, Sica, & Caudek, 2017), Japanese (Sumi, 2014a; Sumi, 2014b), Mandarin (Lin, 2015), Persian (Fassih-Ramandi, Soleimani, Allen, Gorgulu, & Motalebi, 2020; Khodarahimi, 2013), Portuguese (da Fonseca, da Silva, Macedo, Vione, & Veloso, 2015; Silva & Caetano, 2013), Russian (Didino, Taran, Barysheva, & Casati, 2019), Spanish (Checa, Perales, &

Espejo, 2018; Pozo-Munoz, Garzon-Umerenkova, Bretones-Nieto, & Ligia-Charry, 2016; Ramires-Maestre et al., 2017), and Urdu (Choudhry et al., 2018). It has been found to have well-established psychometric properties in these validation studies. However, research of well-being is still limited in Arabic context (Al-Darmaki et al., 2015). To date, there is only one study conducted by Salama-Younes (2017) that tested the FS among university student samples in Egypt. However, there are significant cultural differences and languages specificities between Saudi Arabia and Egypt and the application of a transcribed scale into Arabic may not be parallel in both countries. Moreover, the reliability and validity of the FS Arabic version was only evaluated based on student samples, therefore the measurement invariance of the scale has not been assessed between student and non-student samples. Testing of measurement invariance is a crucial aspect of scale validation since it allows valid comparisons and interpretations to be made between groups (Putnick & Bornstein, 2016). Therefore, the aim of the study was to assess the psychometric properties and measurement invariance of the Arabic version of the FS in two samples of university students and full-time employees in the Saudi context.

2. Method

2.1 Participants and Procedure

Data was collected from two samples, one of university students and one of full-time employees, in Saudi Arabia. An online survey designed on Google form was distributed via an online link in an email to the participants between 25 December 2020 to 21 January 2021. The total number of participants of both samples was 1268, of whom 58.1% (N=737) were females. The student sample consisted of 969 undergraduate and postgraduate students from two universities, namely Saudi Electronic University and Qassim University. Most students were females (640, 66%) and their ages ranged from 20 to 57 years old ($M = 28.63$, $SD = 6.37$). The students were from several different colleges, including business administration, health sciences, computer sciences, law, and social sciences. The employee sample consisted of 299 individuals working in various sectors such as hospitals, schools, and banks. Most employees were males (202, 67.6%), were married (209, 69.9%). Less than half of employees were aged between 25-34 years (43.1%), followed by the 35-44 year age group (34.5%), and the 45-54 year age group (17.4%). Few employees (5%) were over the age of 55 years. The range of their working experience was 1 to 40 years ($M = 13.43$, $SD = 8.81$). All participants were informed about the purpose of the study and were given the right to remain anonymity. All participants completed the demographic items and the FS, along with other measures. Two staff members of the English department at Hail University translated the measures from English to Arabic. Following that, they were translated back to English to verify the accuracy of the translations.

2.2 Measures

Flourishing Scale (FS). The FS is an 8-item measure of positive aspects of human functioning such as relationships, self-esteem, meaning and purpose of life, and optimism (Diener et al., 2010). Items were scored on a 7-point Likert scale starting from 1 (strongly disagree) to 7 (strongly agree). Examples of these items include “I lead a purposeful and meaningful life” and “I am a good person and live a good life”. Total scores range from 8 to 56 with higher scores indicating greater levels of positive psychological functioning.

Satisfaction with Life Scale (SWLS). The SWLS is a 5-item measure of worldwide satisfaction with different aspects of life (Diener et al., 1985). Items were scored on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Example of these items include; “In most ways my life is close to my ideal” and “The conditions of my life are excellent”. Total scores range from 5 to 35, with higher scores indicating greater levels of life satisfaction.

The Centre of Epidemiological Studies Depression Scale (CES-DS). The CED-DS is an 8-item measure of the frequency of depressive symptomatology including depressive affect, sadness, loneliness, and sleep disturbance (Radloff, 1977). Items were scored on a 4-point Likert scale ranging from 0 (non or almost none of the time), 1 (some of the time), 2 (most of the time), to 3 (all or almost all of the time), with the two positively phrased items “I enjoyed life” and “I was happy” were reverse scored. Total scores range from 0 to 24, with higher scores indicating greater depressive symptomatology.

Happiness (H). Happiness was measured with a Fordyce’s (1988) one item measure of general happiness, “Taking all things together, how happy would you say you are?” This item was scored on an 11-point scale ranging from 0 (extremely unhappy) to 10 (extremely happy).

Life Satisfaction (LS). Life satisfaction was assessed with one item measure from the World Values Survey (OECD, 2013). The item “All things considered, how satisfied are you with life as a whole nowadays?” was scored on a scale of 11 points ranging from 0 (extremely dissatisfied) to 10 (extremely satisfied).

2.3 Data Analysis

Descriptive statistics of the FS were calculated and reliability was obtained using internal consistency by calculating Cronbach's alpha coefficient. Confirmatory factor analysis (CFA) and multi-group confirmatory factor analysis (MGCFA) were conducted to test the factor structure and the measurement invariance of the FS across study samples. To assess convergent validity, the FS was correlated with other measures of well-being and happiness: Fordyce's one item of happiness; Satisfaction with life scale; and one item satisfaction with life. Discriminant validity was tested by calculating the correlation between the FS with the CES-DS. Data analyses were performed using SPSS 26.0 and Amos 24.0.

3. Results

3.1 Descriptive Analysis and Internal Consistency

The means, standard deviations, range of scores, and internal consistency are presented in Table 1 for the FS in the two samples. University students had a slightly lower level of flourishing than employees. Student's mean score was 5.66 (SD= 0.99) with a range from 1 to 7. For the employee sample, the mean score on the FS was 6.07 (SD= 0.71) with a range from 3 to 7. The FS had good internal consistency in both samples, with Cronbach's alpha values equal to 0.87 and 0.84 in the student and employee samples, respectively.

Table 1. Descriptive statistics, internal consistency, and factor loading for the Arabic Flourishing Scale across study samples

Flourishing scale	Student sample (N = 969)		Employee sample (N = 299)	
	Mean (SD)	Standardized factor loading	Mean (SD)	Standardized factor loading
I lead a purposeful and meaningful life	5.63 (1.39)	0.76	5.91 (1.13)	0.78
My social relationships are supportive and rewarding	5.08 (1.50)	0.71	5.82 (1.07)	0.75
I am engaged and interested in my daily activities	5.11 (1.53)	0.73	5.65 (1.23)	0.66
I actively contribute to the happiness and well-being of others	5.45 (1.43)	0.48	5.99 (1.14)	0.48
I am competent and capable in the activities that are important to me	6.13 (1.13)	0.64	6.45 (0.72)	0.38
I am a good person and live a good life	5.72 (1.41)	0.80	6.18 (0.88)	0.78
I am optimistic about my future	6.01 (1.40)	0.74	6.19 (1.14)	0.66
People respect me	6.11 (1.12)	0.60	6.41 (0.80)	0.58
Cronbach's alpha	0.87		0.84	
Mean	5.66		6.07	
SD	0.99		0.71	

Note. All factor loadings were significant at $p < .001$.

3.2 Factorial Validity

Before conducting CFA to confirm the factor structure of the FS, data of both student sample and employee sample were checked for normality distribution assumption. The assumption of normality in both samples was satisfied. The absolute values of skewness (students = 1.89 and employees = 2.23) and kurtosis (student = 3.48 and employee = 3.41) for all items in both samples did not exceed 3 and 10, respectively (Kline, 2005). Thus, CFA was conducted using maximum likelihood estimation method to evaluate the one-factor structure of the Arabic version of the FS.

Model fit was assessed with the following indices: Goodness of Fit Index (GFI), Comparative Fit Index (CFI), Standardized Root Mean Square Residual (SRMR), and Root Mean Square Error of Approximation (RMSEA) with a 90% confidence interval (90% CI). The cut-off values for evaluating whether the model fits the data well were: GFI, CFI $\geq .90$, and SRMR, RMSEA $\leq .08$ (Browne & Cudeck, 1993; Byrne, 2016; Hu & Bentler, 1999).

In the student sample, the one-factor model of the FS obtained good fit indices (GFI = 0.96, CFI = 0.95, SRMR

= 0.03, RMSEA = 0.08 [90% CI = 0.077-0.101]. The results also showed a good fit between the data and one-factor model of the FS for employee sample (GFI = 0.95, CFI = 0.95, SRMR = 0.04, RMSEA = 0.08 [90% CI = 0.057-0.105]). The standardized factor loadings are shown in Table 1. All factor loadings were significant at $p < .001$, ranging from 0.48 to .80 in the student sample, and from 0.38 to 0.78 in the employee sample. These results confirmed the one-factor structure of the FS in an Arabic cultural context.

3.3 Measurement Invariance

After verifying the factor structure of the FS, the measurement invariance for the one-factor model across study sample groups (students and employees) was tested using MGCFA. Three different levels of invariance were sequentially tested: configural, metric, and scalar invariance. Configural invariance tests whether the one-factor model is observed between comparison groups. Metric invariance tests the equivalence of the factor loadings for each item between groups, implying that students and employees understand and interpret the items similarly. Scalar invariance tests the equivalence of item intercepts and this implies that any differences across groups in the means of the items are a result of true differences in the means of their corresponding construct. The difference in fit indices were used to assess invariance of the one-factor model across groups. A change in CFI (Δ CFI) of less than 0.010 with a change in RMSEA (Δ RMSEA) of less than 0.015 or a change in SRMR (Δ SRMR) of less than 0.030 suggest evidence of invariance (Byrne & van de Vijver, 2010; Chen, 2007). Results of invariance analyses are shown in Table 2. The configural model provided good fit to the data (GFI = 0.96, CFI = 0.95, SRMR = 0.04, RMSEA = 0.06 [90% CI = 0.054-0.069]), indicating that the one-factor structure of FS was equal across groups. The metric invariance model was also supported (Δ CFI = .008, Δ RMSEA = .000, Δ SRMR = .026), but the scalar invariance model did not hold (Δ CFI = .011, Δ RMSEA = .005, Δ SRMR = .076).

Table 2. Measurement invariance of the Arabic Flourishing Scale across study samples

Model	Overall fit indices				Comparative fit indices			
	χ^2 (df)	CFI	RMSEA (90% CI)	SRMR	$\Delta\chi^2$ (df)	Δ CFI	Δ RMSEA	Δ SRMR
Configural	230.65 (40)	0.952	0.061 (0.054, 0.069)	0.0438	-	-	-	-
Metric	269.14 (47)	0.944	0.061 (0.054, 0.068)	0.0699	38.49 (7)	0.008	0.000	0.0261
Scalar	313.73 (54)	0.933	0.066 (0.059, 0.073)	0.1457	44.59 (7)	0.011	0.005	0.0758

Note. *df* = degrees of freedom; CFI = comparative fit index; RMSEA = root mean square error of approximation; CI = confidence interval.

3.4 Convergent and Discriminant Validity

Table 3 presents the correlations between the FS and other measures on the full sample of students and employees. Convergent validity was tested by calculating the correlations between the FS and other measures of well-being and happiness: SWLS; Fordyce's single item of happiness, and single item satisfaction with life. As expected, the FS significantly and positively correlated with SWLS ($r = 0.73$, $p < .001$), happiness ($r = 0.64$, $p < .001$), and satisfaction with life ($r = 0.65$, $p < .001$). To assess discriminant validity, the FS was correlated with the CES-DS as a measure of depression. The CES-DS demonstrated a negative correlation with the FS ($r = -0.54$, $p < .001$), supporting the discriminant validity of the FS.

Table 3. Correlations between the Flourishing Scale with other relevant scales (all samples, N = 1268)

Measures	FS	SWLS	Happiness	Life Satisfaction
SWLS	0.729***			
Happiness	0.643***	0.695***		
Life Satisfaction	0.650***	0.745***	0.800***	
CED-DS	-0.536***	-0.558***	-0.706***	-0.602***

Note. FS Flourishing Scale, SWLS Satisfaction with Life Scale, CED-DS The Centre of Epidemiological Studies Depression Scale, *** p -value < 0.001 ; ** p -value < 0.01 ; * p -value < 0.05 .

4. Discussion

The aim of the study was to evaluate the psychometric properties and measurement invariance of the Arabic version of the FS in an Arabic context. Data was gathered from two samples, one of university students and one of full-time employees, in Saudi Arabia. The psychometric properties of the Arabic FS were tested for internal consistency, CFA, and convergent and discriminant validity. Results of the reliability analysis displayed that the

internal consistency estimates for both samples were good. The Arabic FS performed well in terms of convergent and discriminant validity with other scales of well-being, happiness, life satisfaction, and depression. These results are consistent with previous studies (Diener et al., 2010; Duan & Xie, 2019; Giuntoli et al., 2017).

As in the primary study (Diener et al., 2010), CFA showed a one-factor structure. The one-factor model was also consistent with findings from China (Duan & Xie, 2019), France (Villieux et al., 2016), Italy (Giuntoli et al., 2017), Japan (Sumi, 2014a), Taiwan (Lin, 2015), Iran (Fassih-Ramandi et al., 2020), Portugal (Silva & Caetano, 2013), Russia (Didino et al., 2019), Spain (Ramires-Maestre et al., 2017), India (Premchandran & Priyadarshi, 2018), Egypt (Salama-Younes, 2017), Canada (Romano, Ferro, Patte, Diener, & Leatherdale, 2020), and New Zealand (Hone, Jorden, & Schofield, 2014). Results also provided support for full metric measurement invariance between students and employees. This displayed that the one-factor structure of FS was equal throughout all groups and both students and employees understand and interpret the items similarly.

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Appendix

The Arabic version of the Flourishing Scale

7-point Likert scale:

Original English version	Arabic version
1- Strongly disagree	1- غير موافق على الإطلاق
2- Disagree	2- غير موافق
3- Slightly disagree	3- غير موافق إلى حد ما
4- Mixed or neither agree nor disagree	4- محايد أو لست موافق ولست معارض
5- Slightly agree	5- موافق إلى حد ما
6- Agree	6- موافق
7- Strongly agree	7- موافق جداً

Items

Original English version	Arabic version
1- I lead a purposeful and meaningful life.	1- أعيش حياة هادفة وذات معنى.
2- My social relationships are supportive and rewarding.	2- علاقاتي الاجتماعية داعمة ومجزية.
3- I am engaged and interested in my daily activities.	3- أستمع واهتم بأنشطتي اليومية.
4- I actively contribute to the happiness and well-being of others.	4- أساهم بنشاط من أجل سعادة ورفاهية الآخرين.
5- I am competent and capable in the activities that are important to me.	5- أنا كفوء وقادر على أداء الأنشطة المهمة بالنسبة لي.
6- I am good person and live a good life.	6- أنا شخص جيد وأعيش حياة جيدة.
7- I am optimistic about my future.	7- أنا متفائل بمستقبلي.
8- People respect me.	8- الناس يحترمونني.

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