Psychometric and Gender Invariance Analysis of the Flourishing Scale in the Malaysian Context

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Abstract
The Flourishing Scale is a new scale designed to measure psychological well-being. FS has been translated into more than 10 languages (e.g., Portuguese, Russian, Turki, Spanish, Egyptian, French, Chineses, Japanese, Malay, Urdu, and Persian). The psychometric analysis of the Flourishing Scale has not been explored in the Malaysian context. The aims of the current study were to examine the factor structure, reliability, concurrent validity (correlate with Satisfaction with Life Scale [SWLS] and Life Project Reflexivity Scale [LPRS]) of the Flourishing Scale (FS). The EFA was conducted to explore the factor structure of FS in the Malaysian context. Then, CFA was run to test the model fit of the FS in the Malaysian context. Test of measurement invariance was also conducted to ascertain the generalizability of the factor structure of FS across gender groups. A cross-sectional survey with 663 university students (435 female students and 228 male students) from a public university in Sabah, Malaysia was conducted. The EFA results revealed a single factor solution with a total explained variance of 68.31%. The CFA result also revealed a one-factor structure with all eight items loaded in one factor. The multi-group analysis of this model demonstrated invariance by gender. FS also demonstrated high reliability and good concurrent validity. The FS was positively and significantly correlated with Satisfaction with Life Scale scores, Life Project Reflexivity Scale score and its subscale. The results supported FS appears to be a valid measure of a flourishing state, and its utilities in the Malaysian context is proven, including gender comparisons.

Keywords
flourishing scale, psychometric analysis, gender invariance, Malaysian context

Introduction
There are various ways to gather primary data either qualitative sources (i.e., field observation, interview, and informal discussion) or quantitative data sources (survey questionnaire and interview questions; Soleyew, 2019). Although each of the methods applies to different techniques, the aim is to gather research data. Most researchers prefer to collect data by using a standardized survey questionnaire which has been used and tested both to determine the reliability and validity values. The standardized questionnaire that is designed by the primary research team, will be further translated by other researchers into different languages and adapted based on the target population’s culture or context. For instance, Diener et al. (2009) designed a Flourishing scale (FS) which has been widely used and translated into more than ten languages (i.e. Portuguese, Russian, Turki, Spanish, Egyptian, French, Chineses, Japanese, Malay, Urdu, and Persian). This shows that this instrument is an important and popular measure, and its popularity might also be influenced by its attractive name, “flourishing” (Schatanus-Dijkstra et al., 2016).

The FS is designed to gauge an individual’s major dimension of social-psychological functioning, contribution to the well-being of others, including purpose and meaning, supportive relationships, optimism, engagement, competence, being respected, and self-acceptance. Although previous studies have shown the validity of the Flourishing Scale for several languages, The present study adds to the literature by providing evidence of the validity of the Flourishing Scale in the Malaysian Context. Besides, cultural factor (such as the relationship between text, culture, and person) has also been

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taken into account in the process of translating the scale into the Malay version.

Flourishing is defined as a state in which a person demonstrates higher levels of social-psychological as well as subjective well-being (Diener et al., 2009). Diener et al. (2010) theorized flourishing as the fulfilment of the needs of self-acceptance, relatedness, competence, and the possession of psychological capital. People with high in the flourishing state tend to experience higher emotional, psychological, and social well-being (Keyes, 2007).

The FS that was designed by Diener et al. (2010) has been generally used for research and clinical purposes including clinical training and well-being intervention studies. This is because of its briefness, simplicity, and inclusiveness. The 8-item FS measures individual self-perceived success in the major function of their lives including self-esteem, relationships, optimism, and purpose. It measures a single psychological well-being scale. According to Hone et al. (2014), flourishing individuals are more productive at the workplace, learn more efficiently, enjoy better social relationships, tend to help their communities, face fewer restrictions on daily activities, increase life expectancy, and enhance emotional health.

In developing the FS scale, Diener et al. (2010) involved 689 university students from various universities in Singapore and the United States as participants. The study revealed that the FS scale is compatible with other well-being scales (e.g., the Satisfaction with Life Scale). The one-dimensional structure of FS was verified with CFA (Confirmatory Factor Analysis) and the Rasch model. Based on the literature review (e.g., Da Fonseca et al., 2015; Duan & Xie, 2016; Munoz & Nieto, 2019) revealed that CFA of the Flourishing scale is fit to the model used in their studies and there is still a need to analyze the CFA of this scale based on cultural or context of one population. For instance, the internal consistency of this scale was tested and analyzed by researchers from various cultural backgrounds, Spanish (Munoz & Nieto, 2019), Brazil (Da Fonseca et al., 2015), Chinese (Duan & Xie, 2016; Tong & Wang, 2017), Netherlands (Schotanus-Dijkstra et al., 2016), and New Zealand (Hone et al., 2014).

The FS in the Spanish version was validated by Munoz and Nieto (2019), using the Rasch analysis. The Rasch analysis can investigate many scopes such as the scale’s dimensionality, each item adjustment, items internal consistency, construct validity, the differential item functioning (DIF) and the response categories functioning. Furthermore, to determine the external construct validity, correlated measures were used, which showed an adequate internal consistency and a one-dimensional scale structure. The FS scale also showed a significant relationship with another scale such as satisfaction with social support and coping scales and well-being scales, and they all showed good convergent validity. The FS scale was also studied by Da Fonseca et al. (2015) in the Brazilian context and they found that the FS scale showed satisfactory internal consistency of the scale with a one-factor solution. Da Fonseca’s (2015) study also reported convergent validity which showed a positive relationship with the construct of positivity. The validity of the FS was also shown in the Chinese community samples by past studies (i.e., Duan & Xie, 2016; Tong & Wang, 2017).

Apart from cultures, the FS has also been psychometric analyzed in diverse populations such as student samples, a community sample, a full-time employee sample, and a nationally representative population sample. By using EFA and CFA analysis, past studies also reported a single factor structure of the scale. In addition, it also showed acceptable to excellent reliability values, ranging from .78 to .95 (Schotanus-Dijkstra et al., 2016). The first version of the FS was labeled as the Psychological Flourishing scale which consisted of 12 items (Diener & Biswas-Diener, 2008). The FS scale has been amended and the latest version of the FS consisted of eight items was known as the Psychological Wellbeing scale. The FS is a valid and reliable tool that can be used with adults with suboptimal well-being to measure social-psychological functioning. Nevertheless, its use in clinical practice and intervention studies might be arguable (Schotanus-Dijkstra et al., 2016).

The FS also showed good convergent evidence. Past studies revealed that FS correlated moderately to strongly positive correlations with other psychological well-being scales (i.e., Basic Needs Satisfaction Scale and Ryff’s Psychological Well-Being Scale). The FS also showed moderate to strong negative correlations with other anxiety, stress, and depression scales (Diener et al., 2009; Sumi, 2014). The convergent evidence of the FS has been strongly supported by the subjective well-being scales such as life-satisfaction scale, happiness, and positive emotions scales (Schotanus-Dijkstra et al., 2016). Munoz and Nieto’s (2019) study also found a significant correlation between the FS scale and other scales (i.e., the well-being, social support, and coping scales).

Based on the preceding argument, the FS scale showed a good psychological well-being construct, and it has been widely used across different cultures and populations. Seligman (2011) considered the FS scale as a good measurement of well-being. In this study, the CFA of the FS scale was examined based on the Malaysian context. Besides, the concurrent validity of the FS scale with other existing well-being scales (i.e., Satisfaction with Life Scale [SWLS] and Life Project Reflexivity [LPRS]) were also examined. The measurement invariance was also conducted to discover the generalizability of the factor structure of FS across gender groups.

Method

Respondents

The current study consisted of 663 undergraduate students (228 male and 435 female) from one of the universities in Sabah, Malaysia (with ages ranging from 18 to 28 years), of all 32% was the students in their second year of study and
68% was third-year students. The sample of this study was selected using a convenience sampling method. The respondents involved in this study were the students who attended the researchers’ lecture.

The sample size of this study was determined based on the recommendation of sufficient statistical power and the expense of data collection. Tabachnick et al. (2001) suggested a minimum sample size of 200 to conduct a multivariate statistical technique, and to run a confirmatory factor analysis, the ratio of cases to free parameters should be 10:1 (Kline, 2005). The Flourishing Scale contained eight constructs and there were 663 cases involved in this study, which means that the ratio of cases to free parameters was about 83:1 which indicated the size of the sample for the current study was sufficient and should not be an issue.

**Instruments**

**The Flourishing Scale (FS).** The Flourishing Scale (FS) was developed to measure individual positive functioning (e.g., optimism, positive relationships, self-esteem, and purpose and meaning in life). FS comprises eight items that provide an overall well-being score. The responses for the items were based on 7-point scales (from 1=strongly disagree to 7=strongly agree). The respondents who gain high scores indicate that the respondent view him/her as positive terms in functioning. The examples of the items: “I am engaged and interested in my daily activities” and “I am a good person and live a good life”. FS showed a high level of reliability for the Italian version (α=.89) and for the Malaysian version with α=.93 (Chua et al., 2020).

**Life Project Reflexivity Scale (LPRS).** Life Project Reflexivity Scale (LPRS) proposed by Di Fabio et al. (2018), it consists of 15 items to measure three dimensions: Clarity/Projectuality, Authenticity, and Acquiescence that are generally aligned with the tenets of life and identity construction theory (Guichard, 2005). Authenticity refers to individuals’ awareness of their future career-personal-life projects as a basis of authentic values. Clarity/Projectuality refers to individuals’ clarity in assessing what they want to become in their next life chapters. Acquiescence refers passively accepting values imposed by society rather than basing their own career-life projects on authentic values. The items response format was a 5-point Likert scale (from 1=strongly disagree to 5=strongly agree). The examples of the items: “The projects for my future life are clearly defined” (Clarity/Projectuality); “The projects for my future life are full of meaning for me” (Authenticity); and “The projects for my future life are more anchored by the values of the society in which I live than my most authentic values” (Acquiescence). The Cronbach Alpha coefficient for the Malaysian version of LPRS was .87 for Clarity/Projectuality, .88 for Authenticity, .83 for Acquiescence, and .90 for the total score (Chua et al., 2020).

**The Satisfaction with Life Scale (SWLS).** The Satisfaction with Life Scale (SWLS) consists of five items, it is created to measure overall satisfaction with life (Diener et al., 1985). Diener et al. claimed that Satisfaction with life is a cognitive process of judgment. Based on their own criteria, the individuals assess the quality of their life. In this cognitive process, the person weighs their personal life priorities, judges them as a whole, and defines them as more or less satisfactory (Diener & Biswas-Diener, 2008). The response format for the SWLS item was a 7-point scale (from 1=strongly disagree to 7=strongly agree). High scores indicate high satisfaction with life. The level of reliability for the SWLS was Cronbach’s alpha=.89 (Pavot & Diener, 2008) and Cronbach’s alpha=.74 in the Malaysian context.

The three instruments had been back-to-back translated into Bahasa Malaysia via an English version by the researchers of this study. The instruments were presented to the respondents as a bilingual questionnaire because Bahasa Malaysia is an official language used in Malaysia and English is a second language that is widely understood.

**Data Analysis**

Data of the study were analyzed using the IBM SPSS AMOS 23 Program. An Exploratory Factor Analysis was conducted to determine the factor structure of the Flourishing Scale in the Malaysian context. The Confirmatory Factor Analysis (CFA) was conducted to test the single-factor model of this scale. We estimated the FS model using the maximum likelihood method. To determine the adequacy of the model, we compared the results of the analysis to the recommended model fit indices suggested by Hu and Bentler (1998; as shown in Table 2). The chi-square value ($\chi^2$) and its associated degree of freedom (df), Goodness of fit GFI), and Adjusted Goodness of Fit (AGFI) value was also reported. In addition, the reliability and validity of FS were also tested in this study.

**Results**

**Exploratory Factor Analysis**

Prior to Exploratory factor analysis (EFA), the items of the Flourishing Scale (FS) were tested with the initial analysis, Bartlett’s test of Sphericity and Kaiser–Meyer–Olkin (KMO) to test for sampling adequacy. The Kolmogorov–Smirnov test, the Shapiro–Wilks test, skewness, and kurtosis values were reported to determine the normality of the data. The outliers (the total score of FS below 20) The analysis revealed that the KMO coefficient of FS was .942 and Bartlett’s test of Sphericity result was significant ($\chi^2=3,777.16$, $p<.001$) which revealed that the sample was sufficient. Although the Kolmogorov–Smirnov test and the Shapiro–Wilks test were significant (the result may be due to the large sample size used in this study), the skewness (−0.345) and kurtosis (−0.746) values indicated that the data of this study were
normally distributed. These results supported the factorability of the FS dataset (Chua et al., 2014).

In this study, Principal Component analysis was conducted using Promax Oblique with Kappa four Rotation to explore the underlying structure of FS in the Malaysian context. All eight items of The FS were analyzed for factors. The decision on the number of factors to extract was based on the criterion of eigenvalues ≥ 1.0. Whereas the criterion used to select items for each factor were the factor loadings of 0.50 or above within one factor (Hair et al., 1998). The results of EFA revealed that the scale only comprised of one factor with an eigenvalue of 5.47, and 68.31% of the total variance in FS. The factor loading for FS items ranged from 0.74 to 0.85.

**The Reliability of the Flourishing Scale**

The method of internal consistency Cronbach’s alpha was used to examine the level of reliability of FS. Cronbach’s alpha with a coefficient greater than .70 indicates adequate reliability (Cortina, 1993). The result indicated a high level of reliability for FS with Cronbach’s alpha = .93. The result of item analysis indicated all the items of FS were in a good range (.67–.80) of the corrected item-total correlation coefficient. The Cronbach Alpha coefficient for FS in the male sample was .98 and in the female sample was .84.

**The Validity of Flourishing Scale**

The validity of FS was tested using concurrent validation strategy by examining the relationship between FS with the Satisfaction with Life Scale (SWLS) score and Life Project Reflexivity Scale score. We hypothesized that the FS score would be positively and significantly associated with SWLS score and LPRS score and its sub-scale.

Refer to Table 1, the FS score was positively and significantly related with SWLS score (r = .31, p < .05) and LPRS score (r = .32, p < .05). The correlation between the FS score with sub-scale of Project Reflexivity Scale range (from r = .19 to .31, p < .001. The results confirmed the concurrent validity of FS.

**Confirmatory Factor Analysis (CFA)**

The result of CFA for the single-factor model of the FS shown in Table 2. The analysis revealed that the FS model showed a good fit to the data, the $\chi^2$ (df) = 180.54 (40), p <.001, CMIN/DF ratio =4.514, CFI=0.963; TLI=0.948; RMSEA=0.073, all achieved the recommended model fit indices. Item loading for FS model indicated the items loaded sufficiently, estimates ranged from .65 (item 3) to .879 (item 8).

**Gender Invariance**

Test of measurement invariance was conducted to ascertain the generalizability of the FS across gender groups using multiple-group confirmatory factor analysis. The analysis was conducted to test whether the unconstrained and constrained models of FS differ based on gender (male students=228 and female students=435). The result showed that there were no significant differences between the unconstrained and constrained models, which indicated that the FS model was valid for male and female groups, the changes

![Table 1. Matric Correlation between the Flourishing Scale Score and the Life Project Reflexivity Scale and Its Sub-Scale.](image)

| Scale                  | Flourishing | Life satisfaction | LPRS<sub>total</sub> | Clarity | Authenticity |
|------------------------|-------------|-------------------|----------------------|---------|--------------|
| Flourishing Life satisfaction | .309**     |                   | .259**               |         |              |
| LPRS<sub>total</sub> Clarity    | .317**     | .297**            | .779**               |         |              |
| Authenticity           | .186**     | .153**            | .803**               | .404**  |              |
| Acquiescence           | .288**     | .254**            | .860**               | .551**  | .529**       |

Note. **Correlation is significant at the .01 level.
LPRS<sub>total</sub> = total score of life project reflexivity scale.

![Table 2. The Confirmatory Factor Analysis for the Flourishing Scale.](image)

| Fit indices         | Recommended fit | Unconstrained model | Constrained model |
|---------------------|-----------------|---------------------|------------------|
| $\chi^2$ (df)      | 180.54 (40)     | 190.62 (48)         |
| CMIN/DF            | CMIM/DF < 5.0   | 4.514               | 3.971            |
| CFI                 | >0.90           | 0.963               | 0.962            |
| TLI                 | >0.90           | 0.948               | 0.956            |
| GFI                 | ≥0.95           | 0.951               | 0.950            |
| AGFI                | ≥0.90           | 0.924               | 0.936            |
| RMSEA               | 0.05–0.08       | 0.073               | 0.067            |
Different countries as well, such as Japan (Sumi, 2014). In a
ings regarding the adequate reliability of the translated ver-
was found that the scale has adequate reliability. Our find-
of internal consistency by determining Cronbach’s alpha, it
the second objective of the present study, using the method
(Howell & Buro, 2015). Therefore, based on the findings of the
study, Diener et al. (2010) reported that the Flourishing Scale
exploratory factor analysis, it was found that the scale only
items and the scores computed from these items provide a
single psychological well-being score of an individual
responding to the instrument.
Concerning our first objective, which was focused on
exploratory factor analysis, it was found that the scale only
comprised of one factor, which is consistent with the work of
Choudhry et al. (2018). While exploring the factor structure of
the Urdu Flourishing Scale, they also reported that based on
principal component analysis with varimax rotation, the Urdu
FS had single factor loadings. Durak and Durak (2019), while
exploring the Psychometric properties of the Turkish
Flourishing Scale, found that a one-factor solution for the FS
was also relevant in the Turkish version. Our findings were also
coherent with the original study of Diener et al. (2010). In their
study, Diener et al. (2010) reported that the Flourishing Scale
showed one strong factor with an eigenvalue of 4.24 which also
accounted for 53% of the variance in the items during principal
axis factor analysis. The factor loadings ranged from 0.61 to
0.77. Therefore, it was concluded that one strong factor charac-
tizes the Flourishing Scale. Besides Choudhry et al. (2018)
and Durak and Durak (2019), our finding was also coherent
with previous research finding from other countries such as
Macau (Tong & Wang, 2017), Portugal (Silva & Caetano,
2013), Spain (Ramirez-Maestre et al., 2017), and Canada
(Howell & Buro, 2015). Therefore, based on the findings of the
present research and the work of previous researchers, it could
be concluded that FS as an instrument of psychological well-
being (is applicable, and) focuses on a single factor only.
As for determining the reliability of the scale, which was
the second objective of the present study, using the method
of internal consistency by determining Cronbach’s alpha, it
was found that the scale has adequate reliability. Our find-
ings regarding the adequate reliability of the translated ver-
sion of the scale have been supported by early researchers in
different countries as well, such as Japan (Sumi, 2014). In a
study by Choudhry et al. (2018), it was found that Urdu FS
has Cronbach’s alpha of .914. While validating the
Flourishing Scale with 608 Indian adolescents, Singh et al.
(2017) also found that FS has high reliability with Cronbach’s
alpha ranging between .80 and .95.
While responding to our third objective, which focused
on determining the concurrent validity and discriminant
validity, it was found that the Flourishing Scale score was
significantly and positively associated with Satisfaction with
Life Scale score and Life Project Reflexivity Scale score and
its sub-scale. These findings are supported by the work of
Singh et al. (2017), while validating the Flourishing Scale by
correlating the scales with Mental Health Continuum and its
factors, they found that all correlation coefficients were sig-
nificant and ranged from −.25 to .87.
The fourth research objective, which was focused on
exploring the measurement invariance across gender the
result found that the model was valid for both genders and
there was no significant invariance reported among scores
obtained by males and females. This finding is also consist-
tent with Diener et al. (2010). Even though the results indi-
cated no significant invariance, it was found that Cronbach
Alpha for male participants was relatively high compared to
female participants which could be due to the difference in
the dimensions of psychological well-being measured by FS.
As suggested by Perez (2012), while exploring the gender
differences among Filipino male and female adolescents, it
was stated that there are gender differences and similarities
in the dimensions of psychological well-being such as spiri-
tual, social, and cognitive components. Thus, it could be
assumed that there is no gender invariance in psychometric
properties of scale but there could be difference in overall
psychological well-being which could affect psychometric
values to some extent.
Conclusion
In conclusion, the results of the present study demonstrate
that the FS has a single-factor structure, it has high reliability
and is a valid measure of psychological well-being in the
Malaysian context. It has been established as a reliable and
valid measure of psychological well-being in different coun-
tries like Spain, Japan, Macau, Turkey, Pakistan, India, Russia,
and Iran. The way we see and understand our life experiences
influences our view of our wellbeing and happy-
ness. For instance, in the older generation, people from dif-
f erent socio-economics statuses, ethnicity, cultures, or
religions might view their wellbeing and happiness differ-
ently. The findings suggest that the Malaysian version of FS
can be used as a valid and reliable tool to gauge individuals’
psychological well-being. However, as in the present study,
the sample comprised of university students only, therefore
we must be careful while expanding the utility of the FS
Malay version to other population groups. Furthermore, it
would be interesting to explore the applicability of the FS

\[ \Delta \chi^2(8) = 10.08, \ p = .259. \]
scale in the Malaysian context on other target populations such as professionals in various fields, different communities and ethnic groups, marital, and family institutions.

Appendix

Original and Malay Version of the FS Scale (Chua et al., 2020)

Arahan. Berikut adalah lapan pernyataan yang anda mungkin setuju atau tidak setuju. Nyatakan persetujuan anda dengan setiap item dengan menandakan respons anda berdasarkan skala (dari 1 = Sangat tidak bersetuju hingga 7 = Sangat setuju) ke atas setiap pernyataan. Sila jawab dengan jujur.

Instructions. Below are eight statements that you may agree or disagree with. Using the 1 to 7 scale (from 1 = strongly disagree to 7 = strongly agree) below indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your response.

| No. | Item | Strongly Disagree | Agree | Slightly agree | Neither agree nor disagree | Slightly disagree | Disagree | Strongly Agree |
|-----|------|-------------------|-------|----------------|---------------------------|-------------------|----------|---------------|
| 1.  | Saya menjalani kehidupan yang bermakna dan bermakna. *I lead a purposeful and meaningful life.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2.  | Hubungan sosial saya adalah baik dan menggalakan. *My social relationships are supportive and rewarding.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3.  | Saya terlibat dan minat dalam aktiviti harian saya. *I am engaged and interested in my daily activities.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4.  | Saya menyumbang secara aktif terhadap kegembiraan dan kesejahteraan orang lain. *I actively contribute to the happiness and well-being of others.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5.  | Saya kompeten dan berupaya dalam aktiviti yang penting kepada saya. *I am competent and capable in the activities that are important to me.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6.  | Saya seorang yang baik dan hidup dengan baik. *I am a good person and live a good life.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7.  | Saya optimistik tentang masa depan saya. *I am optimistic about my future.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8.  | Orang lain hormat saya. *People respect me.* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

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