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Measurement Invariance of the Meaning in Life Questionnaire Across 17 Countries

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Abstract
The Meaning in Life Questionnaire assesses presence of and search for meaning in life. Although the questionnaire has shown promising psychometric properties in samples from different countries, the scale's measurement invariance across a large number of nations has yet to be assessed. This study is aimed at addressing this gap, providing insight into how meaning in life is constructed and experienced across countries and into the extent to which cross-country comparisons can be made. A total of 3867 adult participants from 17 countries, aged 30–60, balanced by gender, and with at least secondary education, completed the questionnaire as part of the Eudaimonic and Hedonic Happiness Investigation. Single sample confirmatory factor analysis, multigroup confirmatory factor analysis, and alignment optimization were applied to investigate the scale's performance across the samples. Good psychometric properties and high levels of approximate measurement invariance emerged for the Presence subscale after removal of item 9, the only reverse-phrased item. Performance of the Search subscale varied more across samples, suggesting caution in interpreting related results supporting approximate measurement invariance. The conceptualization of presence of meaning operationalized in the corresponding subscale (without item 9) appears consistent across countries, whereas search for meaning seems to be less universally homogenous and requires further exploration. Moreover, the Meaning in Life Questionnaire does not reflect the conceptual distinction between "purpose" and "meaning" currently acknowledged by researchers. This issue should be further explored in studies addressing the scale's performance across cultures.

Keywords Alignment optimization · Cross-cultural measurement invariance · Eudaimonic and Hedonic Happiness Investigation (EHHI) · Meaning in Life Questionnaire · Measurement

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Introduction

Previously, studies investigating well-being across countries and populations were primarily based on the assessment of life satisfaction and/or positive emotions, namely the hedonic dimensions of well-being. More recently researchers have paid increasing attention to other components of well-being, belonging to the conceptual realm of eudaimonia (Vittersø, 2016). Among them, the experience of meaning in life has emerged as a core facet of eudaimonic well-being, in light of its relevance for mental health, goal setting and pursuit, and existential fulfilment. Given the important role of culture in establishing people's values, assumptions, and needs (Markus & Kitayama, 1991), human processes and patterns may carry different manifestations across cultures. Far from referring to a neutral concept, meaning in life is a value-laden construct, derived from cultural worldviews and referring to an experience deeply embedded in social relationships (Baumeister & Landau, 2018; Marujo & Neto, 2014; Van Tongeren et al., 2018; Wissing, 2014; Wissing et al., 2019; Yu & Chang, 2018). The analysis of data collected in different nations and continents may therefore shed light on the dynamics between intrapersonal, interpersonal, contextual, and cultural dimensions contributing to the construction and experience of meaning in life. To pursue this goal, it is however necessary to verify whether psychometric instruments assessing meaning in life operate well across cultures and contexts.

The most frequently used measure of perceived meaning in life is represented by the Meaning in Life Questionnaire (MLQ), developed by Steger and colleagues (2006), which was locally validated in specific countries or in comparative studies involving two or three countries, primarily the target country and the US (examples of studies follow later). The growing international popularity of the MLQ as a highly representative measure of perceived meaning in life, however, requires a more careful exploration of its invariance properties, in order to establish how comparable scores on this scale will be.

This investigation is especially relevant in the current international scenario, characterized by increasing efforts of world agencies and organizations to identify and use reliable and easily administered well-being measures, in order to develop large scale interventions and policies aimed at promoting citizens' individual and collective welfare (e.g., OECD; WHO; European Social Survey; Gallup Poll and the World Happiness Report). To this purpose, international studies conducted in the basic research domain to evaluate well-being measures' solidity, at both the conceptual and cross-cultural levels, are of paramount importance. Due to the above-mentioned focus on measures of life satisfaction and emotion, there is still a lack of information on measures of meaningfulness that can be reliably used in multinational studies and, subsequently, in larger social surveys. One of the projects recently devoted to the understanding of well-being facets across countries is the Eudaimonic and Hedonic Happiness Investigation (EHHI; Delle Fave et al., 2011, 2013, 2016), based on a large international collection of both qualitative and quantitative data across 17 countries, including – among other measures – the Meaning in Life Questionnaire. The assessment of the MLQ's measurement

invariance is a basic prerequisite to adequately compare perceived meaning across samples, and to use this indicator for more complex explorations of well-being related to demographic characteristics. While the countries included in the EHHI (see the Method section for the list of countries) were selected based on connections and collaborations between local research teams and may not be representative of the world population, the countries come from six different continents and significantly increases the geographic reach of the MLQ's cross-cultural assessment, with samples from North America, Latin America, Western Europe, Eastern Europe, Oceania, South Asia, the Middle East, and Africa. The countries represent individualistic and collectivistic cultures, include diverse dominant religions, and have varying socioeconomic profiles as indicated by measures such as gross domestic product and the human development index. In addition, studies of the measurement invariance of the MLQ across countries to date typically included two or three countries, and 17 countries by far extend the number of countries included in such a study. Also, each country's sample of adults was diverse with respect to age, gender, and level of educational attainment.

Overall, the findings from a study of the cross-country invariance of the MLQ across 17 countries may provide researchers and policy makers across countries solid evidence of the adequacy of the MLQ for basic and applied studies, as well as for interventions.

The Meaning in Life Questionnaire

In the past few decades, attention to meaning in life grew considerably in clinical and well-being research, leading to the development of several conceptual models and operational definitions of the construct. One of the most frequently used models of meaning in life was developed by Steger and colleagues (Steger et al., 2006, 2008b). It comprises two dimensions: the presence of meaning in life, representing the individual's perception of their life's meaning and purpose; and the search for meaning in life, that refers to the person's desire and efforts to attain and/or increase the purpose and meaning of life. Theoretically, these dimensions have been postulated to be distinct and relatively independent (Steger et al., 2006).The model was operationalized in the Meaning in Life Questionnaire (MLQ, Steger et al., 2006), which consists of 10 items, five pertaining to the presence of meaning and five to the search for meaning. The two subscales were designed to be relatively orthogonal (Steger et al., 2006). Compared to other instruments evaluating meaning in life, the MLQ has been considered to have outstanding psychometric properties (Brandstätter et al., 2012).

Psychometric Properties

In the original validation study, conducted among US college students, the MLQ displayed adequate internal consistency and test–retest reliability, as well as structural, convergent, and discriminant validity (Steger et al., 2006). The English version of the scale also showed good psychometric properties among Australian adolescents (Rose et al., 2017), South African students (Temane et al., 2014), and Latina/o

youth attending college in the United States (Vela et al., 2017). Portuguese versions displayed overall good psychometric properties in Portugal among older adults (Simões et al., 2010) and Brazil (Damásio & Koller, 2015; De Aquino et al., 2015), but in the Brazilian context better fit was achieved when the subscales were analyzed separately (Damásio & Koller, 2015). Chinese versions displayed good psychometric properties among Hong Kong students, caregivers, and clinical samples (Chan, 2014, 2017; Datu & Yuen, 2021 [in the latter the residual terms of items 6 and 7 were allowed to correlate]) and among Chinese students attending middle school (Wang, 2013) and college (Liu & Gan, 2010; Wang & Dai, 2008). The Hausa version performed well among internally displaced persons in Nigeria (Chukwuorji et al., 2019). The Spanish translation attained good psychometric properties among college students (Steger et al., 2008a), while among adults and adolescents in Argentina its model fit improved after removal of item 9 (Góngora & Solano, 2011). Good psychometric properties were also found for the Italian version, tested among adolescents (Di Fabio, 2014) and adults (Negri et al., 2020), as well as for the scale translations in Turkish (Boyraz et al., 2013), Hindi (Singh et al., 2016), Hungarian (Martos & Konkolÿ Thege, 2012), Japanese (Steger et al., 2008c), Greek (Pezirkianidis et al., 2016), Latvian (Kolesovs, 2019), and Arab and Hebrew (Abu-Raiya et al., 2021). The scale also performed well in Romania (language of administration not specified, Balgiu, 2020).

Cross-cultural Measurement Invariance

Overall, these studies attest to the MLQ's potential for use in different countries, languages and cultural groups. Data are however lacking as concerns scale performance similarity or mean scores comparability across a larger number of nations. Differences in individual and social values may affect the way in which participants perceive items or interpret response scales; this issue is particularly relevant for a culturally rooted construct such as perceived meaning in life. Therefore, the measurement invariance of the MLQ must be evaluated in order to correctly interpret comparative findings derived from different cultural and linguistic groups. Measurement invariance refers to the equivalence of a construct across groups or time (Putnick & Bornstein, 2016). It indicates that a construct has the same meaning for different groups or over time. There are four levels of measurement invariance: configural (equivalent model form), metric (equivalent factor loadings), scalar (equivalent item intercepts), and strict (equivalent items' residuals). Meaningful comparisons between groups usually require that at least scalar invariance is supported, because it means that items have a comparable factor intercepts and loadings among the compared groups (Putnick & Bornstein, 2016). Achieving measurement invariance in cross-cultural research is quite challenging. Many factors can cause lack of measurement invariance, such as using instruments developed in one culture in other cultural contexts, different reference frameworks in self-judgments in diverse cultures, varying cross-cultural response patterns, social desirability and inappropriate translation (Chen, 2008).

The few studies including attempts to assess the measurement invariance of the MLQ, never involved more than three cultural groups. Full metric, partial scalar, and partial invariance of residual variances were obtained between Turkish and US samples (Boyraz et al., 2013); in addition, the two groups did not differ significantly in their Presence and Search subscale scores. Metric invariance of the MLQ was supported among US adolescents with Latin, Asian, and European background (Kiang & Fuligni, 2010); the mean score for Presence of meaning was significantly higher for Latin and Asian Americans compared to European Americans, while Search for meaning was significantly higher for Asian Americans than for the other two groups. Scalar invariance was detected for US and Japanese college students (Steger et al., 2008c), with US students reporting significantly higher Presence of meaning, and Japanese students reporting higher Search. Considering the findings altogether, some level of measurement invariance was generally detected across cultural groups, while subscale mean scores varied across the samples.

Aims of the Study

Although these findings suggest a certain level of measurement equivalence of the MLQ across cultures, to the best of our knowledge no studies have been conducted yet to assess the instrument's measurement invariance across a large number of countries. In addition, the presently unclear pattern of the two subscales' mean scores across cultural groups may be better disentangled through an exploration of country rankings on a large set of countries.

To address these knowledge gaps, the first aim of the present study was to evaluate the measurement invariance of the MLQ across 18 samples from 17 countries. The second aim, if supported by findings of invariance, was to compare the mean scores of the Presence and Search subscales. The study contributes to existing literature in three ways. First, the measurement invariance of the MLQ was explored for the first time across a large number of countries, providing information on the scale's cross-country utility. Second, information was provided on noninvariant items across samples/countries, beyond the general model fit, offering insight for possible scale revisions. Third, the estimated factor mean scores across the 18 samples were compared.

Method

The present study analyzed data from the international Eudaimonic and Hedonic Happiness Investigation (EHHI) project, aimed at exploring different facets of well-being across countries through a mixed methods research design (Delle Fave et al., 2011, 2013, 2016). For this study, data collected through the Meaning in Life Questionnaire and a sociodemographic questionnaire were analyzed.

Participants

The total sample consisted of 3867 participants obtained from 17 countries: Australia, Croatia, Italy, Portugal, South Africa, Argentina, Brazil, India, Mexico, New Zealand, the United States of America, Norway, Hungary, Chile, Israel, Peru, and the Czech Republic; India contributed with two samples, one from the Northern region of India (Delhi and Haryana) and one from the Southern state of Tamil Nadu, which were analyzed separately based on their language and cultural differences. Data for each sample were collected by local researchers. Most countries contributed with $n = 216$ participants, except for South Africa ($n = 215$), Argentina ($n = 208$), New Zealand ($n = 215$), and Israel ($n = 205$). Each local sample was balanced by gender, age group (following the threefold partition 30–39, 40–49, and 50–60 years) and education level (secondary and tertiary education).

The global sample consisted of participants whose mean age was 44.27 years ($SD = 8.81$); 87.1% were employed; 70.8% reported having an average standard of living; as for civil status, 71.4% of the participants were married or cohabitating, 16.8% single, 9.4% separated or divorced, and 1.8% widowed; and as for religion, 35.2% reported never practicing, 32.0% occasionally, and 31.3% regularly.

Procedure

The MLQ was administered in the local language in all countries, except in the multilingual South Africa, where data were gathered in English, the lingua franca commonly used by people with secondary education. In countries where a version of the scale in the local language was not available, translation was performed by a person fluent in both the local language and English, and back translated by another bilingual person; adaptations were made to the translated version if needed (Van de Vijver & Leung, 1997).

Ethics approval for the study was obtained in each country according to the local institutional and legal requirements, and in line with the Helsinki Declaration. Local researchers recruited the participants through nonprobability sampling methods, such as face-to-face interaction and poster advertisements in public areas, snowball sampling, and word-of-mouth. Participation was voluntary. After signing a written informed consent form, participants completed the questionnaires autonomously and returned it to the local researcher in person, by mail or email; in Australia, the USA, and New Zealand it was also possible to complete the questionnaire online.

Measures

Sociodemographic Questionnaire Participants were invited to provide information concerning their gender, age, education level, standard of living, employment status and job typology, marital status, number of children, and religion.

Meaning in Life Questionnaire (MLQ) The MLQ (Steger et al., 2006) is a 10-item scale consisting of two subscales: Presence of meaning (items 1, 4, 5, 6, and 9) and Search for meaning (items 2, 3, 7, 8, and 10). Respondents rate statements from 1 = *Absolutely untrue* to 7 = *Absolutely true.* Only item 9 ("My life has no clear purpose") is reverse-phrased.

Data Analysis

Following Cieciuch et al. (2018), we first applied confirmatory factor analysis to examine the fit of the baseline model for each sample. Then, multigroup confirmatory factor analysis (MGCFA) was applied to assess the measurement invariance of the MLQ across the 18 samples. MGCFA (cf., Byrne & Van de Vijver, 2010; Van de Vijver & Leung, 2011; Vandenberg & Lance, 2000) involves a hierarchical set of steps. The first step consists of fitting a configural model, which assumes that the number of factors and the configuration of fixed and freely estimated parameters hold across all groups without restricting any parameters to be equal. If configural invariance is confirmed, metric invariance is tested, where the factor loadings are restricted to be equal across groups. If metric invariance does not hold, a stepwise procedure can be implemented where free estimation of loadings is allowed one-by-one until a sufficient level of partial metric invariance is obtained. The third step, scalar invariance, requires item intercepts to be equal across all groups. Stepwise freeing of intercepts that prove not to be equal can result in partial scalar invariance. Scalar invariance is a prerequisite for comparing factor mean scores across groups.

With a large number of groups it is highly improbable to obtain complete scalar invariance, that requires exactly the same values for a large set of parameters. Also, making post hoc adjustments to obtain partial invariance in a stepwise fashion is problematic, as these procedures may result in models that are not replicable (Marsh et al., 2018). The recent increase in cross-cultural and multinational studies has prompted an evolution in the statistical techniques that are more appropriate for analyses conducted on a large number of groups. Kim et al. (2017) have provided an overview of five approaches that serve this purpose.

Alignment Optimization Taking into account these guidelines, the approach deemed as most appropriate for the present study is the alignment optimization method developed by Asparouhov and Muthén (2014). This method has been recently used to assess measurement invariance across many groups (e.g., Glassow et al., 2021; Jang et al., 2017; Raudenská, 2020; Sischka et al., 2020; Zakariya et al., 2020). Alignment optimization starts with a well-fitting configural model and then seeks an optimal invariance pattern utilizing a simplicity function similar to the rotation criteria applied with exploratory factor analysis. The algorithm searches for the largest amount of inequivalence in a minimal number of parameters, while allowing the majority of the parameters to be approximately invariant. The final aligned model has the same fit as the configural model, just like the rotated model in exploratory factor analysis is a simplification of the loading matrix without compromising the

fit of the unrotated model. The method also produces estimates for the factor mean scores that can be used to compare groups on the relevant construct (presence of and search for meaning in this study), if evidence is found for adequate levels of measurement invariance.

Following Asparouhov and Muthén (2014) and Muthén and Asparouhov (2018), in order to evaluate the quality of estimation when the alignment method was applied, the estimated parameter values were used to generate data for a simulation study. Two approaches to aggregation were applied. First, the correlation between the true factor means and the estimated factor means was calculated for each replication and averaged over all replications. This value signifies the performance of the alignment method for the extent of noninvariance as well as the sample size. Second, the correlation was computed between the true factor means and the average estimated factor means, with the average calculated over the replications. This value is largely independent of sample size and provides an indication of the performance of the alignment method for the extent of noninvariance studied (Muthén & Asparouhov, 2018). Guidelines suggest that the correlation values should be at least 0.980 (Muthén & Asparouhov, 2014).

Statistical Program and Analysis Specifications All the analyses were done using Mplus Version 8.0 (Muthén & Muthén, 1998–2017). Since the MLQ comprises more than five response options, the robust maximum likelihood (MLR) estimator, which assumes continuity of data, was deemed as appropriate to correct for any deviations from normality (Blunch, 2008; Rhemtulla et al., 2012). As recommended by Asparouhov and Muthén (2014), free alignment was specified, where all samples' factor means and variances were estimated freely. Missing data were handled by applying full information maximum likelihood estimation (for the total sample, 0.25% of the data on the MLQ were missing).

Upon request, the data used for this study are available from the second author and analysis code from the corresponding author.

Results

Single Sample CFA

To assess model fit for the single sample CFAs, we examined the global fit indices reported in Table 1. Nonsignificant χ^2 statistics (i.e., yielding large *p*-values) and comparative fit index (CFI) values larger than 0.900 (earlier guidelines) or 0.950 (later guidelines) support good fit; root mean square error of approximation (RMSEA) values of 0.050 or less indicate good fit, and values less than 0.080 reasonable fit (Byrne, 2012). Since the χ^2 statistic is largely dependent on sample size, it is reported but not interpreted. Possible sources of misfit were identified from

Table 1 CFA global fit indices for all samples

	Complete MLQ: 10-item 2-factor CFA			Complete MLQ: 9-item 2-factor CFA (item 9 omitted)			MLQ Presence: 5-item 1-factor CFA			MLQ Presence: 4-item 1-factor CFA (item 9 omitted)			MLQ Search: 5-item 1-factor CFA		
Sample	χ^2 (df=34)	CFI	RMSEA	χ^2 (df=26)	CFI	RMSEA	χ^2 (df=5)	CFI	RMSEA	χ^2 (df=2)	CFI	RMSEA	χ^2 (df=5)	CFI	RMSEA
1. Australia	86.080***	.943	.084	69.520***	.948	.088	7.070	.990	.044	5.819	.976	.094	15.628**	.976	.099
2. Croatia	139.629***	.832	.120	121.929***	.833	.131	17.443**	.952	.107	9.522**	.959	.132	37.120***	.856	.172
4. Italy	59.911**	.968	.059	39.649*	.981	.049	5.904	.996	.029	3.828	.991	.065	3.513	1.000	.000
5. Portugal	101.777***	.898	.096	80.858***	.908	.099	5.094	.999	.009	0.606	1.000	.000	24.517***	.936	.134
7. South Africa	150.227***	.856	.126	79.228***	.923	.098	13.321*	.969	.088	0.304	1.000	.000	26.100***	.924	.140
8. Argentina	113.993***	.878	.106	55.626***	.946	.074	18.941**	.933	.116	7.476*	.962	.115	10.526	.977	.073
9. Brazil	148.654***	.863	.125	56.652***	.958	.074	41.088***	.824	.183	11.560**	.943	.149	26.668***	.945	.142
10. North India	146.786***	.819	.124	137.256***	.813	.141	2.633	1.000	.000	0.930	1.000	.000	34.679***	.881	.166
13. Mexico	147.640***	.776	.124	74.057***	.887	.093	1.737	1.000	.000	0.076	1.000	.000	14.877*	.947	.096
14. New Zealand	72.992***	.961	.073	54.984***	.967	.072	17.961**	.963	.110	11.784**	.962	.151	2.086	1.000	.000
15. USA	102.306***	.934	.096	62.711***	.959	.081	4.077	1.000	.000	3.114	.997	.051	12.006*	.976	.081
16. Norway	126.672***	.831	.112	108.414***	.835	.121	11.137*	.965	.075	8.813*	.951	.126	38.941***	.863	.177
17. Hungary	126.554***	.893	.112	108.358***	.882	.121	7.852	.992	.051	2.036	1.000	.009	41.071***	.851	.183
18. South India	112.221***	.854	.103	96.658***	.856	.112	14.203*	.939	.092	11.125**	.922	.145	43.102***	.847	.188
19. Chile	96.588***	.925	.092	70.883***	.940	.089	6.427	.993	.036	6.566*	.972	.103	3.996	1.000	.000
20. Israel	109.887***	.849	.104	100.903***	.840	.119	8.573	.981	.059	7.036*	.968	.111	15.677**	.942	.102
22. Peru	74.915***	.948	.075	60.228***	.952	.078	3.527	1.000	.000	3.066	.994	.050	10.123	.985	.069
23. Czech Republic	65.865***	.960	.096	48.278***	.970	.063	15.862**	.967	.100	10.897**	.968	.144	15.794**	.965	.100

Note. *p < .05. **p < .01. *** p < .001. MLQ = Meaning in Life Questionnaire; CFA = Confirmatory Factor Analysis; χ^2 = Chi-square Test Statistic; df = Degrees of freedom; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation. Sample numbers represent their numbers in the original dataset and are therefore non-sequential

small factor loadings on the target factor, large item residual variances, small item R^2 values, and large modification indices (Byrne, 2012).

Table 1 clearly shows that a 2-factor CFA model, where the Presence and Search factors were allowed to correlate, did not yield good fit for several samples (CFI < 0.900 for 11 samples; 0.900 < CFI < 0.950 for 4 samples; RMSEA > 0.080 for 15 samples). Item 9 ("My life has no clear purpose"), the only reverse-phrased item in the scale, yielded a relatively small factor loading on the target factor (Presence), a relatively large residual variance, and a relatively small R^2 value for almost all samples. After dropping the item, the fit improved for several samples, but in many cases it was still inadequate (CFI < 0.900 for 7 samples; 0.900 < CFI < 0.950 for 5 samples; RMSEA > 0.080 for 12 samples).

In the next step, therefore, the Presence and Search subscales were analyzed separately. Considering the CFI values, the global fit for the Presence subscale was good for almost all samples (CFI < 0.900 for 1 sample; 0.900 < CFI < 0.950 for 2 samples). In some cases, large RMSEA values did not support good fit (RMSEA > 0.080 for 6 samples), but when the degrees of freedom are small (which is the case with these single factor models), RMSEA tends to falsely indicate poor model fit (Kenny et al., 2015). Although global model fit was generally good for the Presence subscale, item 9 tended to manifest small factor loadings, large residual variances and small R^2 values. Dropping the item produced a model with acceptable fit for all samples considering the CFI values (CFI > 0.900 for all samples). (Notably, RMSEA > 0.080 for 10 samples, but this model had only 2 degrees of freedom, confirming the above stated issue with RMSEA tending to produce false rejection of model fit.)

For the Search subscale model fit varied across the samples, with five samples attaining CFI values lower than 0.900. Modification indices suggested that fit may be improved by correlating the residual variances of items 2 ("I am looking for something that makes my life feel meaningful") and 10 ("I am searching for meaning in my life") for some samples, and of items 3 ("I am always looking to find my life's purpose") and 8 ("I am seeking a purpose or mission for my life") for other samples. In both cases we deemed the correlations justifiable based on linguistic similarity as items 2 and 10 both refer to "meaning" and items 3 and 8 to "purpose". These adapted models were applied to all samples, but the small incremental improvement obtained across the samples did not justify the addition of a parameter.

Measurement Invariance across the 18 Samples using MGCFA

The results of the MGCFA measurement invariance testing are shown in Table 2. Since the single sample CFAs did not support the 2-factor model, MGCFA was performed separately for the two subscales. We were hesitant to apply MGCFA to the Search subscale, since the baseline model did not yield good fit for all samples. Nonetheless, we decided to report the related findings, with a cautionary note concerning their possible lack of reliability.

The configural model fit was interpreted using the guidelines for assessing measurement invariance across 10 or more groups (Rutkowski & Svetina, 2014). CFI values larger than 0.950 and RMSEA values less than 0.100 indicate adequate fit.

Table 2 MGCFA global fit indices

Model	χ^2	*df*	CFI	RMSEA	AIC	BIC	Model comparison			
							$\Delta\chi^2$	*df*	ΔCFI	ΔRMSEA
MLQ Presence: 5-item 1-factor MGCFA										
Configural	186.87***	90	.978	.071	60,731.29	62,421.55				
Metric	331.61***	158	.961	.072	60,797.60	62,062.17				
Scalar	793.16***	226	.872	.108	61,217.36	62,056.23				
Configural vs Metric							144.78***	68	.017	-.001
Metric vs Scalar							550.71***	68	.089	-.036
MLQ Presence: 4-item 1-factor MGCFA (item 9 omitted)										
Configural	102.98***	36	.980	.093	46,758.04	48,110.25				
Metric	211.31***	87	.963	.082	46,808.00	47,840.94				
Scalar	514.87***	138	.887	.113	47,065.55	47,779.21				
Configural vs Metric							106.83***	51	.017	.011
Metric vs Scalar							356.37***	51	.076	-.031
MLQ Search: 5-item 1-factor MGCFA										
Configural	349.32***	90	.951	.116	70,046.97	71,737.09				
Metric	620.46***	158	.912	.117	70,194.29	71,458.75				
Scalar	1173.78***	226	.820	.140	70,686.92	71,525.72				
Configural vs Metric							273.44***	68	.030	-.001
Metric vs Scalar							625.05***	68	.101	-.023

Note. *** $p < .001$; MLQ = Meaning in Life Questionnaire; MGCFA = Multigroup Confirmatory Factor Analysis; χ^2 = Chi-square Test Statistic; *df* = Degrees of freedom; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation; AIC = Akaike's Information Criterion; BIC = Bayesian Information Criterion; $\Delta\chi^2$ = Likelihood Ratio Test (difference in chi-square between nested models); ΔCFI = Difference in CFI between nested models; ΔRMSEA = Difference in RMSEA between nested models

The smaller the values of the Akaike information criterium (AIC) and the Bayesian information criterium (BIC), the better the fit. The results of the chi-square test are also reported, but not interpreted due to the test's sensitivity to sample size. For both subscales, the configural models displayed adequate fit without the need to remove any items. However, based on findings from the single sample CFAs which suggested that item 9 may be problematic, we repeated the analyses for the Presence subscale without item 9, and support was found for configural invariance.

To assess if metric and scalar invariance hold, the likelihood ratio test (difference in chi-square between nested models) was applied. It enables comparing the fit of the metric model with the fit of the configural model and the fit of the scalar model with the fit of the metric model. Results are reported but not interpreted, because of the test's dependency on sample size. The difference between the CFI and RMSEA values of nested models (ΔCFI and ΔRMSEA, respectively) will be instead used for interpretation (Chen, 2007; Cheung & Rensvold, 2002). Rutkowski and Svetina (2014) suggested that $\Delta CFI < 0.020$ indicates adequate levels of invariance when the number of groups is large, while ΔRMSEA should be less than 0.030 to support metric invariance and less than 0.010 to support scalar invariance. In this study, support was found for metric invariance for each subscale, but not for scalar invariance. In view of the lack of exact scalar invariance, we applied alignment optimization (Asparouhov & Muthén, 2014).

Approximate Measurement Invariance using Alignment Optimization

Alignment optimization was applied to each subscale, but findings for the Search subscale should be interpreted with caution. Table 3 displays the contribution of each item's intercept and loading to the optimized simplicity function, where higher values indicate higher levels of measurement noninvariance (Asparouhov & Muthén, 2014). Table 3 also shows the R^2 values, where R^2 indicates the proportion of the parameter's variation that is attributable to the variation of its underlying factor's mean and variance rather than error variance (Ivanova et al., 2018). Higher R^2 values indicate higher levels of measurement invariance, with $R^2 = 1$ implying that all the variance in the parameter is attributable to variation in the underlying factor's mean and variance (Ivanova et al., 2018). Items 4 (Presence) and 8 (Search) displayed the highest level of measurement invariance, while item 9 (Presence) exhibited the lowest level of measurement invariance, especially due to the intercepts' noninvariance.

Table 4 displays the (non-) invariance results for the measurement intercepts and factor loadings. Samples obtaining a significantly noninvariant measurement parameter are denoted by an X. For the full Presence subscale, the intercepts were invariant for items 5 and 6, but noninvariant for item 1 in two samples (Mexico and Norway) and for item 4 in two samples (North and South India). Noninvariant intercepts for item 9 were identified in 10 of the 18 samples. The factor loadings of all Presence items were invariant, except for the loading of item 9 for New Zealand. Overall, 30.56% of the item 9 parameters were noninvariant, which is in excess of the 25% rule of thumb suggested by Muthén and Asparouhov (2014). After omitting

Table 3 Alignment fit statistics

Subscale	Item	Intercepts		Loadings		Total fit function contribution
		Fit function contribution	R^2	Fit function contribution	R^2	
Presence (all items)	1. I understand my life's meaning	-68.830	.657	-62.959	.616	-131.789
	4. My life has a clear sense of purpose	-61.510	.895	-55.547	.769	-117.058
	5. I have a good sense of what makes my life meaningful	-59.198	.749	-63.738	.332	-122.936
	6. I have discovered a satisfying life purpose	-66.177	.766	-61.622	.635	-127.799
	9. My life has no clear purpose	-98.498	.261	-69.837	.525	-168.335
Presence (item 9 omitted)	1. I understand my life's meaning	-66.109	.712	-63.168	.626	-129.277
	4. My life has a clear sense of purpose	-61.617	.901	-54.516	.837	-116.134
	5. I have a good sense of what makes my life meaningful	-59.798	.759	-62.661	.471	-122.459
	6. I have discovered a satisfying life purpose	-67.711	.757	-60.919	.637	-128.630
Search	2. I am looking for something that makes my life feel meaningful	-85.530	.417	-55.385	.829	-140.915
	3. I am always looking to find my life's purpose	-60.484	.785	-62.369	.535	-122.854
	7. I am always searching for something that makes my life feel significant	-67.147	.797	-71.727	.375	-138.874
	8. I am seeking a purpose or mission for my life	-55.155	.900	-59.175	.399	-114.330
	10. I am searching for meaning in my life	-82.167	.732	-63.254	.577	-145.421

Table 4 Approximate measurement (non-) invariance for intercepts and loadings across samples

Approximate measurement (non-) invariance for intercepts and loadings across samples

	Scale	Item	Australia (1)	Croatia (2)	Italy (4)	Portugal (5)	South Africa (7)	Argentina (8)	Brazil (9)	North India (10)	Mexico (13)	New Zealand (14)	USA (15)	Norway (16)	Hungary (17)	South India (18)	Chile (19)	Israel (20)	Peru (22)	Czech Republic (23)
Intercepts	Presence (all items)	1									X			X						
		4								X						X				
		5																		
		6																		
		9	X		X	X		X				X	X		X		X		X	X
	Presence (item 9 omitted)	1									X			X						
		4								X										
		5																		
		6																		
	Search	2		X		X					X									
		3																		
		7																		X
		8																		
		10	X		X					X		X								X
Loadings	Presence (all items)	1																		
		4																		
		5																		
		6																		
		9										X								
	Presence (item 9 omitted)	1																		
		4																		
		5																		
		6																		
	Search	2																		
		3									X									
		7								X						X				
		8																		
		10																		

Note. X indicates that the particular sample obtained a significantly noninvariant measurement parameter. Sample numbers represent their numbers in the original dataset and are therefore non-sequential

item 9 from the Presence subscale, only 3 intercepts and no loadings were noninvariant, suggesting that estimated factor mean scores can be compared across samples in subsequent steps. For the Search subscale, the intercepts of items 3 and 8 were invariant, as well as the loadings of items 2, 8, and 10. Overall, item 8 was invariant, while the number of noninvariant parameters ranged between one (2.78%) for item 3 and five (13.89%) for item 10. No Search item had more than 25% noninvariant parameters, supporting subsequent comparison of estimated factor mean scores.

Table 4 also shows that the number of noninvariant parameters was very low across samples. For the Presence subscale, after removal of item 9, 15 samples did not present any noninvariant parameter, while three samples (North India, Mexico, and Norway) had one (10%). For the Search subscale, nine samples yielded no noninvariant parameters, six samples (Australia, Croatia, Italy, Portugal, New Zealand, and Chile) had one (10%), and three samples (North India, Mexico, and the Czech Republic) had two (20%).

Comparison of Factor Mean Scores across Samples

Table 5 displays the estimated factor mean scores (item 9 removed from the Presence subscale) for all samples when the alignment method was applied, with the scores being ordered from the highest to the lowest. For Presence of meaning, Mexico attained the highest mean score, and Israel the lowest one; for Search for meaning, North India scored the highest and Portugal the lowest. The table also shows, for each sample, which of the other samples had significantly lower estimated factor mean scores ($\alpha = 0.05$). For example, as concerns Peru, three samples (Australia, Italy, and Israel) yielded significantly lower factor mean scores on Presence. When interpreting the estimated factor mean scores and corresponding country rankings, however, it is important to keep in mind that the samples were not representative of each country's population and that the findings may therefore not represent true population scores.

Monte Carlo Simulation Check

The simulation study allowed for checking how well the alignment method worked under conditions that closely resemble the data under examination; the two approaches to aggregate the correlations produced diverging results. In both cases, we used $n = 216$, 500 replications, and 18 samples. First, the correlations between the true factor means and the estimated factor means, calculated for each replication and averaged over all replications, were 0.961 and 0.971 for the Presence and Search subscales, respectively. These values fell somewhat below the guideline value of 0.980, possibly because the sample sizes were too small to support trustworthy comparison of factor means across the groups (Muthén & Asparouhov, 2014). To estimate what sample sizes could provide more trustworthy results, we ran additional simulation studies. As reported in Table 6, sample sizes of 400 and 300 may result in the recommended correlation values of 0.980 for the Presence and Search subscales, respectively. Second, the correlations between the true factor means and the average estimated factor means, with the average calculated over the replications, were 0.999 and 0.998, respectively. These values are above the suggested guideline values and therefore support adequate performance of the alignment method.

Table 5 Estimated factor mean scores of the Presence (item 9 omitted) and Search subscales of the MLQ for the 18 samples

	Presence			Search		
Rank	Sample	Factor mean	Samples with significantly smaller factor mean (α = .05)	Sample	Factor mean	Samples with significantly smaller factor mean (α = .05)
1	Mexico	-0.18	7, 10, 16, 9, 5, 8, 22, 15, 2, 23, 17, 14, 1, 4, 20	North India	-0.23	7, 2, 20, 14, 1, 13, 22, 15, 19, 4, 23, 9, 8, 5
2	South India	-0.31	7, 10, 16, 9, 5, 8, 22, 15, 2, 23, 17, 14, 1, 4, 20	Hungary	-0.30	2, 20, 14, 1, 13, 22, 15, 19, 4, 23, 9, 8, 5
3	Chile	-0.35	16, 9, 5, 8, 22, 15, 2, 23, 17, 14, 1, 4, 20	South India	-0.33	20, 14, 1, 13, 22, 15, 19, 4, 23, 9, 8, 5
4	South Africa	-0.53	2, 17, 14, 1, 4, 20	Norway	-0.39	20, 14, 1, 13, 22, 15, 19, 4, 23, 9, 8, 5
5	North India	-0.55	23, 17, 14, 1, 4, 20	South Africa	-0.42	20, 14, 1, 13, 22, 15, 19, 4, 23, 9, 8, 5
6	Norway	-0.60	17, 14, 1, 4, 20	Croatia	-0.52	22, 15, 19, 4, 23, 9, 8, 5
7	Brazil	-0.61	17, 14, 1, 4, 20	Israel	-0.59	19, 4, 23, 9, 8, 5
8	Portugal	-0.66	17, 14, 1, 4, 20	New Zealand	-0.61	23, 9, 8, 5
9	Argentina	-0.66	17, 14, 1, 4, 20	Australia	-0.70	8, 5
10	Peru	-0.71	1, 4, 20	Mexico	-0.71	8, 5
11	USA	-0.73	4, 20	Peru	-0.72	8, 5
12	Croatia	-0.74	4, 20	USA	-0.76	8, 5
13	Czech Republic	-0.82	4, 20	Chile	-0.81	8, 5
14	Hungary	-0.92	20	Italy	-0.81	8, 5
15	New Zealand	-0.92	20	Czech Republic	-0.83	8, 5
16	Australia	-0.94	20	Brazil	-0.86	8, 5
17	Italy	-1.10		Argentina	-1.16	
18	Israel	-1.26		Portugal	-1.34	

Note. MLQ = Meaning in Life Questionnaire. Sample codes: 1 = Australia, 2 = Croatia, 4 = Italy, 5 = Portugal, 7 = South Africa, 8 = Argentina, 9 = Brazil, 10 = North India, 13 = Mexico, 14 = New Zealand, 15 = USA, 16 = Norway, 17 = Hungary, 18 = South India, 19 = Chile, 20 = Israel, 22 = Peru, 23 = Czech Republic. Sample numbers represent their numbers in the original dataset and are therefore non-sequential

Table 6 Monte Carlo simulation check of 18-sample alignment

	Correlation between true factor means and estimated factor means computed for each replication and averaged over the replications							Correlation between true factor means and average estimated factor means with the average calculated over the replications						
n	100	200	300	400	500	1000	2000	100	200	300	400	500	1000	2000
Presence	.921	.958	.972	.979	.983	.992	.996	.998	.999	.999	1.000	1.000	1.000	1.000
Search	.939	.968	.979	.984	.988	.994	.997	.996	.998	.999	.999	.999	1.000	1.000

Discussion

Single sample CFAs of the MLQ showed that, for several national samples, a 2-factor model did not produce good fit. When analyzing the subscales separately, the Presence subscale yielded good fit for all samples, especially after removing item 9, the only reverse-phrased item. The Search subscale produced good fit for some but not all samples, suggesting that findings pertaining to Search in subsequent invariance analyses should be interpreted with caution. MGCFA applied separately to the Presence and Search subscales provided support for configural and metric, but not scalar invariance. When applying alignment optimization, items 4 (Presence) and 8 (Search) were highly invariant, while item 9 (Presence) was significantly noninvariant. Several samples yielded no noninvariant parameters, and the remaining ones a very low number. After removal of item 9, adequate levels of approximate measurement invariance supported comparison of the samples' estimated factor mean scores. Samples were then ranked based on their estimated factor mean scores for Presence and Search, respectively.

Performance of the Presence and Search Subscales

While the Presence subscale holds promise for future use across countries, particularly after removing item 9, the Search subscale's usefulness across countries is questioned. As also noted by other researchers (cf. King & Hicks, 2021), the conceptualization of search for meaning should be further refined. In this regard, Wong (2018) distinguishes between negatively-oriented search for meaning, that prompts people to find explanations and solutions for problems, and positively-oriented search for meaning, that encourages people to discover their true purpose in life. Further exploration of the construct of search for meaning and its manifestations in different cultural contexts is warranted. For example, the Indian perspective includes four major life purposes called Purusharthas: Dharma (righteousness), Artha (wealth), Kama (pleasure), and Moksha (liberation). In such a world view, meaning varies according to individuals' developmental stage and is grounded in a self-transcendent perspective.

In addition, the available literature concerning the cultural understanding and correlates of the two meaning in life facets has provided equivocal evidence. Some

of the studies conducted on this topic suggested a recurrent negative association between presence and search for meaning in individualistic countries (Negri et al., 2020; Steger et al., 2006, 2008b), while in collectivistic ones positive or absent correlations emerged between the two dimensions (Kiang & Fuligni, 2010; Steger et al., 2008c). Other studies however provided less straightforward results, with negative associations between presence of and search for meaning detected in participants from collectivistic Turkey (Boyraz et al., 2013) and India (Singh et al., 2016), and in a multicultural sample form South Africa (Temane et al., 2014). Variations also emerged in relation to age, with adolescents seeming more prone to perceive both presence and search for meaning than adults (Brassai et al., 2012). Finally, some studies identified an interaction between gender and ethnicity in the association between presence and search for meaning (Kiang & Fuligni, 2010): Among participants with Latin American background, women had lower levels of search for meaning than men, whereas the opposite trend was detected in European American and Asian samples. Alltogether, these findings call for a more systematic comparison of the MLQ across countries and samples.

Furthermore, although Steger et al. (2006) used the words "meaning" and "purpose" as synonyms (e.g., "greater meaning or purpose in life" on p. 81 and "presence of meaning or purpose" on p. 83), participants might understand them differently. In the MLQ, the term "meaning in life" is used in four items, whereas "purpose" is used in five items. The associations and denotations of these two constructs may overlap or differ in various cultural contexts. Reker et al. (1987) distinguished between meaning, that refers to “making sense, order, or coherence out of one’s existence” (p. 44), and purpose, that refers to “intention, some function to be fulfilled, or goals to be achieved” (p. 44). More recently, Martela and Steger (2016) propose a tripartite structure of "meaning in life", including coherence (the cognitive component), purpose (the motivational component), and significance (the existential component). Further exploration is therefore necessary to ascertain whether the equation of meaning and purpose in the MLQ influences the scale’s performance across countries and cultures.

In addition, people may understand presence of meaning from two different perspectives: Firstly, “having meaning” – a more abstract sense of having an overall meaning in life, that is more cognitive and includes being able to identify personal values and sources of meaning; and secondly, “experiencing meaning” – a more concrete, experiential presence of meaning in life (cf. Russo-Netzer, 2019). Reflecting these nuances in the formulation of a scale assessing presence of meaning may further enhance our understanding of the construct and its concomitants and dynamics.

Performance of Item 9

Consistent with previous evidence (e.g., Góngora & Solano, 2011; Hallford et al., 2018; Schutte et al., 2016), item 9 (Presence) displayed questionable fit in single-sample analyses, and it was the most noninvariant item across countries. It is the only reverse-phrased item in the MLQ (“My life has no clear purpose”) and represents the direct negation of item 4 (“My life has a clear sense of purpose”).

Although reverse-phrased items may hold certain benefits (e.g., control acquiescence and careless responding, broaden the content domain covered), formulating an item as the mere negation of a positively phrased one does not broaden the content domain, while possessing inherent disadvantages such as cross-cultural differences in response styles such as acquiescence (Weijters & Baumgartner, 2012). Alternatively, item 9 could tap into meaninglessness, but equating meaninglessness with low levels of presence of meaning is questionable (King & Hicks, 2021). While further research is needed to better understand whether item 9 performs poorly due to methodological issues related to its reverse phrasing, or whether it may signify a conceptual difference between meaninglessness and the absence of presence of meaning, we recommend removing item 9 from the scale, particularly in cross-cultural/cross-country studies. A possibility might be to replace item 9 with a new positively phrased item that refers to "significance", which is now recognized, together with understanding / coherence and purpose, as one of the three core components of meaning in life (George & Park, 2016; King & Hicks, 2021; Martela & Steger, 2016). In the current version of MLQ, "significance" only features in the Search subscale, "I am always searching for something that makes my life feel significant" (item 7).

Comparison of Meaning Scores across Samples

A high level of invariance was attained when alignment optimization was applied, allowing for the comparison of the estimated mean scores across the samples. Invariance was particularly good for the Presence subscale (item 9 removed), that also displayed good fit in most single sample CFAs. Different cultural factors may influence MLQ scores, one being the degree of a culture's individualism/collectivism. In order to explore this possibility, the average individualism scores (Hofstede-Insights, 2018, July 13) for the examined countries are provided in the Appendix. Comparisons should however be interpreted with caution, since both sets of data were obtained from non-representative and non-overlapping samples.

On average, participants from countries with higher levels of individualism reported lower scores on Presence of meaning in life. Several studies have shown that family and other close interpersonal relationships are primary sources of meaning for people from various cultural contexts (e.g., Baumeister et al., 2013; Delle Fave et al., 2013; King & Hicks, 2021). It has also been argued that meaning is in essence a collective rather than individual phenomenon (Baumeister & Landau, 2018) and that meaning and relatedness are core components of positive functioning, rooted and transmitted in the interaction between biology and culture (Delle Fave & Massimini, 2015; Wissing et al., 2019). Considering the entwinedness of meaning and relatedness, it could be unsurprising that people from cultures that place more emphasis on interconnectedness may experience higher levels of meaning in life. However, the association between presence of meaning and collectivism is not consistent across the countries. For example, although Norway is more individualistic according to the scores presented in the Appendix, it scored relatively high on Presence of meaning, whereas the relatively collectivistic Portugal scored

low, when compared to the other countries. Other contextual factors, such as political system, resource distribution and social stratification may also play a role, and they should be investigated in future research. As concerns the Search subscale, no clear pattern emerged in its associations with individualism / collectivism. This finding should be however observed with caution, considering the lack of good fit of the Search subscale for several samples.

In line with previous inconclusive evidence on the association between meaning and individualism / collectivism (Boyraz et al., 2013; Kiang & Fuligni, 2010; Steger et al., 2008c), the cultural roots and correlates of meaning in life seem to be intricate. Additionally, the understanding and significance of Search for meaning could interact with the level of experienced Presence, and this could, in turn, be associated with cultural values such as individualism / collectivism. In this regard, evidence was found for the relationship of Search for meaning with higher subjective well-being in more collectivistic countries (Li et al., 2021). Other studies suggested that Search for meaning contributes to well-being only when Presence of meaning is very high (Park et al., 2010) or when people who have already found meaning continue to actively search for meaning (Steger et al., 2011).

Overall, the dynamic interplay between meaning and culture deserves further attention. A shared network of meaning is being ceaselessly constructed, distributed, and reconstructed among the set of interconnected individuals constituting a given culture (Chiu & Hong, 2007). Culture, thus, represents a framework or a web of meaning that enables individuals to function in a given ecology (Fiske, 2000).

Limitations and Future Directions

Although this study adds to the body of literature on meaning in life, it is not without limitations. As concerns samples, the inclusion of geographically and culturally diverse countries was not derived from a random or representative selection, and some geographical regions are underrepresented. Moreover, the participants were adults between 30 and 60 years of age, living in urban areas and with at least a secondary education diploma. Future research should investigate the replicability of the findings among participants from rural areas, with different age and education levels, and from other countries and regions. The size of each sample was small, as also suggested by the simulation study; larger sample sizes may have resulted in more reliable results. In addition, the MLQ was translated to the local language for many of the samples, and the words used in translated versions may differ from the original scale in nuance and connotations. More research is needed to address the cross-cultural complexities of how social constructs such as meaning in life are understood and expressed in language. This is particularly important regarding search for meaning for which measurement was found to be largely noninvariant across countries. Qualitative approaches may be particularly informative to pursue this goal. This study did not systematically compare the correlation between presence of and search for meaning in life

scores across countries or sociodemographic variables such as age and gender. Such investigation in the future can shed light on this debated topic.

An exploratory examination of mean score comparisons across the countries based on aggregate collectivism and individualism scores was performed, but sample differences between local datasets may call comparability into question. Additional insight may derive from research involving representative samples and assessing meaning in life together with other facets of well-being, cultural values, and other sociodemographic determinants of human functioning. Linked to this, the current study reports on the cross-country rather than cross-cultural measurement invariance of the MLQ, since cultural values and dimensions were not assessed, and country was used as a proxy for culture. Including measures of cultural values and dimensions in the future will allow for a deeper understanding of how culture may influence the experience, expression, connotations, and correlates of different facets of meaning in life.

At the analytical level, the alignment optimization method, although promising, is relatively new and more research is needed to validate interpretation guidelines, such as the 25% cut-off criterion for noninvariance (Jang et al., 2017).

Conclusions

The Presence subscale of the MLQ displayed good psychometric properties across 18 samples from 17 countries, particularly after removal of item 9, the only reverse-phrased item. In contrast, the Search subscale's performance varied more across the samples. Based on the study findings, we recommend that item 9 should be removed from the Presence subscale. Search scores can only be used if model fit is supported for the specific country sample. The good psychometric performance of the Presence subscale suggests not only that the subscale holds promise for use across countries and contexts, but also that presence of meaning in life may be a universal phenomenon ingrained in human experience. The Search subscale seems to be less appropriate for cross-country studies, possibly due to a higher heterogeneity of the construct and of its cultural understanding. More exploration is needed to better understand the meaning, manifestations, and correlates of search for meaning within and across countries and cultures, as well as the role of religion in finding meaning. Conceptually, the MLQ does not reflect the recently developed tripartite structure of meaning in life (Martela & Steger, 2016); therefore, the impact of equating the words "purpose" and "meaning" on the MLQ performance across cultures remains to be further studied.

Appendix

Ranking of Countries on Individualism

Country	Individualism
United States	91
Australia	90
Hungary	80
New Zealand	79
Italy	76
Norway	69
South Africa	65
Czech Republic	58
Israel	54
India	48
Argentina	46
Brazil	38
Croatia	33
Mexico	30
Portugal	27
Chile	23
Peru	16

Note. Values retrieved from Hofstede-Insights (www.hofstede-insights.com/product/compare-countries/) on 13 July 2018

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Data, Materials and/or Code Availability The data used for this study are available from the second author (ibrdar@uniri.hr) upon reasonable request and after consultation of local Ethics Approval Committees and/or university legal offices. Analysis code for this study is available from the corresponding author upon reasonable request.

Declarations

Ethics Approval Ethics approval for the study was obtained in each country according to the local institutional and legal requirements, and in line with the Helsinki Declaration.

Informed Consent Participants gave informed consent prior to participating in the study.

Competing Interests None of the authors have competing interests to declare.

References

Abu-Raiya, H., Sasson, T., & Russo-Netzer, P. (2021). Presence of meaning, search for meaning, religiousness, satisfaction with life and depressive symptoms among a diverse Israeli sample. *International Journal of Psychology, 56*(2), 276–285. https://doi.org/10.1002/ijop.12709

Asparouhov, T., & Muthén, B. (2014). Multiple-group factor analysis alignment. *Structural Equation Modeling: A Multidisciplinary Journal, 21*(4), 495–508. https://doi.org/10.1080/10705511.2014.919210

Balgiu, B. A. (2020). Meaning in Life Questionnaire: Factor structure and gender invariance in a Romanian undergraduates sample. *Revista Românească pentru Educaţie Multidimensională, 12*(2), 132–147. https://doi.org/10.18662/rrem/12.2/270

Baumeister, R. F., & Landau, M. J. (2018). Finding the meaning of meaning: Emerging insights on four grand questions. *Review of General Psychology, 22*(1), 1–10. https://doi.org/10.1037/gpr0000145

Baumeister, R. F., Vohs, K. D., Aaker, J. L., & Garbinsky, E. N. (2013). Some key differences between a happy life and a meaningful life. *The Journal of Positive Psychology, 8*(6), 505–516. https://doi.org/10.1080/17439760.2013.830764

Blunch, N. J. (2008). *Introduction to structural equation modelling using SPSS and AMOS*. Sage. http://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2008-05818-000&site=ehost-live

Boyraz, G., Lightsey, O. R., & Can, A. (2013). The Turkish version of the Meaning in Life Questionnaire: Assessing the measurement invariance across Turkish and American adult samples. *Journal of Personality Assessment, 95*(4), 423–431. https://doi.org/10.1080/00223891.2013.765882

Brandstätter, M., Baumann, U., Borasio, G. D., & Fegg, M. J. (2012). Systematic review of meaning in life assessment instruments. *Psycho-Oncology, 21*(10), 1034–1052. https://doi.org/10.1002/pon.2113

Brassai, L., Piko, B. F., & Steger, M. F. (2012). Existential attitudes and Eastern European adolescents' problem and health behaviors: Highlighting the role of the Search for Meaning in Life. *Psychological Record*, *62*(4), 719–733. https://doi.org/10.1007/BF03395831

Byrne, B. M. (2012). *Structural equation modeling with Mplus: Basic concepts, applications, and programming*. Routledge.

Byrne, B. M., & Van de Vijver, F. J. R. (2010). Testing for measurement and structural equivalence in large-scale cross-cultural studies: Addressing the issue of nonequivalence. *International Journal of Testing, 10*(2), 107–132. https://doi.org/10.1080/15305051003637306

Chan, W. C. H. (2014). Factor structure of the Chinese version of the Meaning in Life Questionnaire among Hong Kong Chinese caregivers. *Health & Social Work, 39*(3), 135–143. https://doi.org/10.1093/hsw/hlu025

Chan, W. C. H. (2017). Assessing meaning in life in social work practice: Validation of the Meaning in Life Questionnaire among clinical samples. *British Journal of Social Work, 47*(1), 9–27. https://doi.org/10.1093/bjsw/bcv144

Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement ivariance. *Structural Equation Modeling: A Multidisciplinary Journal, 14*(3), 464–504.

Chen, F. F. (2008). What happens if we compare chopsticks with forks? The impact of making inappropriate comparisons in cross-cultural research. *Journal of Personality and Social Psychology, 95*(5), 1005–1018. https://doi.org/10.1037/a0013193

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling, 9*(2), 233–255. https://doi.org/10.1207/S15328007SEM0902_5

Chiu, C.-y, & Hong, Y.-y. (2007). Cultural processes: Basic principles. In A. W. Kruglanski & E. T. Higgins (Eds.), *Social psychology: Handbook of basic principles* (2nd ed., pp. 785–804). The Guilford Press.

Chukwuorji, J. C., Ekpedoho, E. A., Ifeagwazi, C. M., Iorfa, S. K., & Nwonyi, S. K. (2019). Psychometric properties of the Meaning in Life Questionnaire – Hausa version among internally displaced persons in Nigeria. *Transcultural Psychiatry, 56*(1), 103–122. https://doi.org/10.1177/1363461518794218

Cieciuch, J., Davidov, E., & Schmidt, P. (2018). Alignment optimization: Estimation of the most trustworthy means in cross-cultural studies even in the presence of noninvariance. In E. Davidov, P. Schmidt, J. Billiet, & B. Meuleman (Eds.), *Cross-cultural analysis* (2nd ed., pp. 571–592). Routledge.

Damásio, B. F., & Koller, S. H. (2015). Meaning in Life Questionnaire: Adaptation process and psychometric properties of the Brazilian version. *Revista Latinoamericana De Psicología, 47*, 185–195. https://doi.org/10.1016/j.rlp.2015.06.004

Datu, J. A. D., & Yuen, M. (2021). Factorial validity of Meaning in Life Questionnaire in Hong Kong secondary school students: A construct validation approach. *Counselling Psychology Quarterly*, 1–14. https://doi.org/10.1080/09515070.2021.1875989

De Aquino, T. A. A., Veloso, V. G., De Aguiar, A. A., Serafim, T. D. B., Pontes, Ad. M., Pereira, Gd. A., & Fernandes, A. S. (2015). Questionário de Sentido de Vida: Evidências de sua Validade Fatorial e Consistência Interna [Meaning in Life Questionnaire: Evidence of its factor validity]. *Psicologia: Ciência e Profissão, 35*(1), 4–19. https://doi.org/10.1590/1982-3703001332012

Delle Fave, A., Brdar, I., Freire, T., Vella-Brodrick, D., & Wissing, M. P. (2011). The eudaimonic and hedonic components of happiness: Qualitative and quantitative findings. *Social Indicators Research, 100*(2), 185–207. https://doi.org/10.1007/s11205-010-9632-5

Delle Fave, A., Brdar, I., Wissing, M. P., Araujo, U., Castro Solano, A., Freire, T., . . . Soosai-Nathan, L. (2016). Lay definitions of happiness across nations: The primacy of inner harmony and relational connectedness. *Frontiers in Psychology, 7*, 1–23. https://doi.org/10.3389/fpsyg.2016.00030

Delle Fave, A., Brdar, I., Wissing, M. P., & Vella-Brodrick, D. A. (2013). Sources and motives for personal meaning in adulthood. *The Journal of Positive Psychology, 8*(6), 517–529. https://doi.org/10.1080/17439760.2013.830761

Delle Fave, A., & Massimini, F. (2015). Cultural change and human behavior: Evolution or development? *Crossing the Border: International Journal of Interdisciplinary Studies, 3*(1), 41–52.

Di Fabio, A. (2014). Meaning in Life Questionnaire: A contribution to the validation of the Italian version with high school students. *Counseling: Giornale Italiano di Ricerca e Applicazioni, 7*(3), 317–325.

Fiske, A. P. (2000). Complementarity theory: Why human social capacities evolved to require cultural complements. *Personality & Social Psychology Review, 4*(1), 76–94. https://doi.org/10.1207/S15327957PSPR0401_7

George, L. S., & Park, C. L. (2016). Meaning in life as comprehension, purpose, and mattering: Toward integration and new research questions. *Review of General Psychology, 20*(3), 205–220. https://doi.org/10.1037/gpr0000077

Glassow, L. N., Rolfe, V., & Hansen, K. Y. (2021). Assessing the comparability of teacher-related constructs in TIMSS 2015 across 46 education systems: An alignment optimization approach. *Educational Assessment, Evaluation and Accountability, 33*(1), 105–137. https://doi.org/10.1007/s11092-020-09348-2

Góngora, V., & Solano, A. C. (2011). Validación del Cuestionario de Significado de la Vida MLQ en población adulta y adolescente argentina [Validation of the Meaning in Life Questionnaire (MLQ) in Argentinean adult and adolescent population]. *Revista Interamericana De Psicología, 45*(3), 395–404.

Hallford, D., Mellor, D., Cummins, R., & McCabe, M. (2018). Meaning in life in earlier and later older-adulthood: Confirmatory factor analysis and correlates of the Meaning in Life Questionnaire. *Journal of Applied Gerontology, 37*(10), 1270–1294. https://doi.org/10.1177/0733464816658750

Hofstede-Insights. (2018). *Compare countries on Hofstede's cultural dimensions*. Retrieved July 13 from https://www.hofstede-insights.com/product/compare-countries/

Ivanova, M. Y., Achenbach, T. M., Rescorla, L. A., Guo, J., Althoff, R. R., Kan, K.-J., … Verhulst, F. C. (2018). Testing syndromes of psychopathology in parent and youth ratings across societies. *Journal of Clinical Child and Adolescent Psychology*, 1–14. https://doi.org/10.1080/15374416.2017.1405352

Jang, S., Eun Sook, K., Cao, C., Allen, T. D., Cooper, C. L., Lapierre, L. M., … Woo, J.-M. (2017). Measurement invariance of the Satisfaction with Life Scale across 26 countries. *Journal of Cross-Cultural Psychology*, *48*(4), 560–576. https://doi.org/10.1177/0022022117697844

Kenny, D. A., Kaniskan, B., & McCoach, D. B. (2015). The performance of RMSEA in models with small degrees of freedom. *Sociological Methods & Research, 44*(3), 486–507. https://doi.org/10.1177/0049124114543236

Kiang, L., & Fuligni, A. J. (2010). Meaning in life as a mediator of ethnic identity and adjustment among adolescents from Latin, Asian, and European American backgrounds. *Journal of Youth and Adolescence, 39*(11), 1253–1264. https://doi.org/10.1007/s10964-009-9475-z

Kim, E. S., Cao, C., Wang, Y., & Nguyen, D. T. (2017). Measurement invariance testing with many groups: A comparison of five approaches. *Structural Equation Modeling, 24*(4), 524–544. https://doi.org/10.1080/10705511.2017.1304822

King, L. A., & Hicks, J. A. (2021). The science of meaning in life. *Annual Review of Psychology, 72*, 561–584. https://doi.org/10.1146/annurev-psych-072420-122921

Kolesovs, A. (2019). Adaptation of the Meaning in Life Questionnaire in Latvian. *Sociālo Zinātņu Vēstnesis*, *1*(28), 109–120.

Li, J.-B., Dou, K., & Liang, Y. (2021). The relationship between presence of meaning, search for meaning, and subjective well-being: A three-level meta-analysis based on the Meaning in Life Questionnaire. *Journal of Happiness Studies, 22*(1), 467–489. https://doi.org/10.1007/s10902-020-00230

Liu, S.-S., & Gan, Y.-Q. (2010). Reliability and validity of the Chinese version of the Meaning in Life Questionnaire. *Chinese Mental Health Journal, 24*(6), 478–482.

Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review, 98*(2), 224–253.

Marsh, H. W., Guo, J., Parker, P. D., Nagengast, B., Asparouhov, T., Muthén, B., & Dicke, T. (2018). What to do when scalar invariance fails: The extended alignment method for multi-group factor analysis comparison of latent means across many groups. *Psychological Methods, 23*(3), 524–545. https://doi.org/10.1037/met0000113

Martela, F., & Steger, M. F. (2016). The three meanings of meaning in life: Distinguishing coherence, purpose, and significance. *The Journal of Positive Psychology, 11*(5), 531–545. https://doi.org/10.1080/17439760.2015.1137623

Martos, T., & Konkolÿ Thege, B. (2012). Those who search and those who find – assessing the presence of and search for the meaning in life with the Hungarian version of the Meaning in Life Questionnaire. *Magyar Pszichológiai Szemle, 67*(1), 125–149. https://doi.org/10.1556/mpszle.67.2012.1.8

Marujo, H. Á., & Neto, L. M. (2014). Felicitas Publica and community well-being: Nourishing relational goods through dialogic conversations between deprived and privileged populations. *Journal of Psychology in Africa, 24*(1), 102–114. https://doi.org/10.1080/14330237.2014.904096

Muthén, B., & Asparouhov, T. (2014). IRT studies of many groups: The alignment method. *Frontiers in Psychology, 5*, 1–7. https://doi.org/10.3389/fpsyg.2014.00978

Muthén, B., & Asparouhov, T. (2018). Recent methods for the study of measurement invariance with many groups: Alignment and random effects. *Sociological Methods & Research, 47*(4), 637–664. https://doi.org/10.1177/0049124117701488

Muthén, B., & Muthén, L. (1998–2017). *Mplus (Version 8.0)*.

Negri, L., Bassi, M., & Delle Fave, A. (2020). Italian validation of the Meaning in Life Questionnaire: Factor structure, reliability, convergent, and discriminant validity. *Psychological Reports, 123*(2), 578–600. https://doi.org/10.1177/0033294118821302

Park, N., Park, M., & Peterson, C. (2010). When is the search for meaning related to life satisfaction? *Applied Psychology: Health and Well-Being, 2*(1), 1–13. https://doi.org/10.1111/j.1758-0854.2009.01024.x

Pezirkianidis, C., Galanakis, M., Karakasidou, I., & Stalikas, A. (2016). Validation of the Meaning in Life Questionnaire (MLQ) in a Greek sample. *Psychology, 7*(13), 1518–1530. https://doi.org/10.4236/psych.2016.713148

Putnick, D. L., & Bornstein, M. H. (2016). Measurement invariance conventions and reporting: The state of the art and future directions for psychological research. *Developmental Review, 41*, 71–90.

Raudenská, P. (2020). The cross-country and cross-time measurement invariance of positive and negative affect scales: Evidence from European Social Survey. *Social Science Research, 86*, 102369. https://doi.org/10.1016/j.ssresearch.2019.102369

Reker, G. T., Peacock, E. J., & Wong, P. T. P. (1987). Meaning and purpose in life and well-being: A life-span perspective. *Journals of Gerontology, 42*(1), 44–49. https://doi.org/10.1093/geronj/42.1.44

Rhemtulla, M., Brosseau-Liard, P. É., & Savalei, V. (2012). When can categorical variables be treated as continuous? A comparison of robust continuous and categorical SEM estimation methods under suboptimal conditions. *Psychological Methods, 17*(3), 354–373. https://doi.org/10.1037/a0029315

Rose, L. M., Zask, A., & Burton, L. J. (2017). Psychometric properties of the Meaning in Life Questionnaire (MLQ) in a sample of Australian adolescents. *International Journal of Adolescence and Youth, 22*(1), 68–77. https://doi.org/10.1080/02673843.2015.1124791

Russo-Netzer, P. (2019). Prioritizing meaning as a pathway to meaning in life and well-being. *Journal of Happiness Studies, 20*(6), 1863–1891. https://doi.org/10.1007/s10902-018-0031-y

Rutkowski, L., & Svetina, D. (2014). Assessing the hypothesis of measurement invariance in the context of large-scale international surveys. *Educational and Psychological Measurement, 74*(1), 31–57. https://doi.org/10.1177/0013164413498257

Schutte, L., Wissing, M. P., Ellis, S. M., Jose, P. E., & Vella-Brodrick, D. A. (2016). Rasch analysis of the Meaning in Life Questionnaire among adults from South Africa, Australia, and New Zealand. *Health and Quality of Life Outcomes, 14*(1), 1–15. https://doi.org/10.1186/s12955-016-0414-x

Simões, A., Oliveira, A. L., Lima, M. P., Vieira, C. M. C., & Nogueira, S. M. (2010). O MLQ: Um instrumento para avaliar o sentido da vida. *Psicologia Educação Cultura, 14*(2), 247–268.

Singh, K., Junnarkar, M., Jaswal, S., & Kaur, J. (2016). Validation of Meaning in Life Questionnaire in Hindi (MLQ-H). *Mental Health, Religion & Culture, 19*(5), 448–458. https://doi.org/10.1080/13674676.2016.1189759

Sischka, P. E., Costa, A. P., Steffgen, G., & Schmidt, A. F. (2020). The WHO-5 Well-being Index – validation based on item response theory and the analysis of measurement invariance across 35 countries. *Journal of Affective Disorders Reports, 1*, 100020. https://doi.org/10.1016/j.jadr.2020.100020

Steger, M. F., Frazier, P., Oishi, S., & Kaler, M. (2006). The Meaning in Life Questionnaire: Assessing the presence of and search for meaning in life. *Journal of Counseling Psychology, 53*(1), 80–93. https://doi.org/10.1037/0022-0167.53.1.80

Steger, M. F., Frazier, P. A., & Zacchanini, J. L. (2008a). Terrorism in two cultures: Stress and growth following September 11 and the Madrid train bombings. *Journal of Loss & Trauma, 13*(6), 511–527. https://doi.org/10.1080/15325020802173660

Steger, M. F., Kashdan, T. B., Sullivan, B. A., & Lorentz, D. (2008b). Understanding the search for meaning in life: Personality, cognitive style, and the dynamic between seeking and experiencing meaning [Article]. *Journal of Personality, 76*(2), 199–228. https://doi.org/10.1111/j.1467-6494.2007.00484.x

Steger, M. F., Kawabata, Y., Shimai, S., & Otake, K. (2008c). The meaningful life in Japan and the United States: Levels and correlates of meaning in life. *Journal of Research in Personality, 42*(3), 660–678. https://doi.org/10.1016/j.jrp.2007.09.003

Steger, M. F., Oishi, S., & Kesebir, S. (2011). Is a life without meaning satisfying? The moderating role of the search for meaning in satisfaction with life judgments. *The Journal of Positive Psychology, 6*(3), 173–180. https://doi.org/10.1080/17439760.2011.569171

Temane, L., Khumalo, I. P., & Wissing, M. P. (2014). Validation of the Meaning in Life Questionnaire in a South African context. *Journal of Psychology in Africa, 24*(1), 81–95. https://doi.org/10.1080/14330237.2014.904088

Van de Vijver, F. J. R., & Leung, K. (1997). *Methods and data analysis for cross-cultural research*. Sage.

Van de Vijver, F. J. R., & Leung, K. (2011). Equivalence and bias: A review of concepts, models, and data analytic procedures. In D. Matsumoto & F. J. R. van de Vijver (Eds.), *Cross-cultural research methods in psychology* (pp. 17–45). Cambridge University Press.

Van Tongeren, D. R., DeWall, C. N., Green, J. D., Cairo, A. H., Davis, D. E., & Hook, J. N. (2018). Self-regulation facilitates meaning in life. *Review of General Psychology, 22*(1), 95–106. https://doi.org/10.1037/gpr0000121

Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational Research Methods, 3*(1), 4–70. https://doi.org/10.1177/109442810031002

Vela, J. C., Ikonomopoulos, J., Lenz, A. S., Hinojosa, Y., & Saldana, K. (2017). Evaluation of the Meaning in Life Questionnaire and Dispositional Hope Scale with Latina/o students. *Journal of Humanistic Counseling, 56*(3), 166–179. https://doi.org/10.1002/johc.12051

Vittersø, J. (2016). *Handbook of eudaimonic well-being*. Springer.

Wang, M.-C., & Dai, X.-Y. (2008). Chinese Meaning in Life Questionnaire Revised in college students and its reliability and validity test. *Chinese Journal of Clinical Psychology, 16*(5), 459–461.

Wang, X.-Q. (2013). Psychometric evaluation of the Meaning in life Questionnaire in Chinese middle school students. *Chinese Journal of Clinical Psychology, 21*(5), 764–767.

Weijters, B., & Baumgartner, H. (2012). Misresponse to reversed and negated items in surveys: A review. *Journal of Marketing Research, 49*(5), 737–747. https://doi.org/10.1509/jmr.11.0368

Wissing, M. P. (2014). Meaning and relational well-being: A reflection on the state of the art and a way forward. *Journal of Psychology in Africa, 24*(1), 183–192. https://doi.org/10.1080/14330237.2014.904100

Wissing, M. P., Schutte, L., & Wilson Fadiji, A. (2019). Cultures of positivity: Interconnectedness as a way of being. In I. Eloff (Ed.), *Handbook of Quality of life in African Societies* (pp. 3–22). Springer.

Wong, P. T. P. (2018). Two-factor theory of search for meaning. http://www.drpaulwong.com/two-factor-theory-of-search-for-meaning/

Yu, E. A., & Chang, E. C. (2018). Construction of the relational meaning in life questionnaire: An exploratory and confirmatory factor-analytic study of relational meaning. *Current Psychology: A Journal for Diverse Perspectives on Diverse Psychological Issues*. https://doi.org/10.1007/s12144-018-0101-7

Zakariya, Y. F., Bjørkestøl, K., & Nilsen, H. K. (2020). Teacher job satisfaction across 38 countries and economies: An alignment optimization approach to a cross-cultural mean comparison. *International Journal of Educational Research, 101*, 101573. https://doi.org/10.1016/j.ijer.2020.101573

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