



Psychometric Properties and Measurement Invariance of the PERMA Profiler in an Ethiopian Higher Education Setting

Girum Tareke Zewude¹, Maria Hercz²

- ¹ University of Szeged, Doctoral School of Education, 7 Góz Square, H-6724 Szeged, Hungary, girumtareke27@gmail.com
² Eötvös Loránd, University Faculty of Primary and Pre-School Education, 40 Kiss János altb Street, H-1126, Budapest, Hungary, hercz.maria@tok.elte.hu

Annotation. The primary goal of the present study was to test the Amharic version of the five-factor PERMA profiler: P (positive emotion), E (engagement), R (positive relationships), M (meaning in life), and A (accomplishment) aimed to assess University instructors' positive functioning of their work. Exploratory factor analysis, single and multi-Group confirmatory factor analysis, measurement invariance, and path analysis were employed. The details of an examination of the PERMA profiler are discussed.

Keywords: *bi-factor model, confirmatory factor analyzes, exploratory factor analyzes, higher-order factor, measurement invariance, PERMA profiler.*

Introduction

Well-being is of great interest to practitioners and the scientific community owing to its innumerable benefits to individuals and organizations (Li, 2018; Mayo et al., 2019). The meaning, formation, and measurement of well-being are central to understanding positive human flourishing and optimal functioning (Brdar, 2011).

Today, only a few well-being models dominate in organizational sciences (Mayo et al., 2019), health sciences (Aldrich, 2014), and education (Lambert et al., 2019). First, the two historically dominant models are the hedonic perspective (Diener, 2009b; life satisfaction, positive affect, negative affect) and the eudemonic model (Ryff & Keyes, 1995; Environmental Mastery, Personal Growth, Positive Relations With Others, Purpose in

Life, Self-Acceptance; Autonomy); these two were originally the most influential. Later, Seligman's (2011) positive well-being model has defined well-being as the organization of five fundamental pillars: positive emotion, engagement in work and life, relationships with others, meaning in life, and accomplishment (PERMA; Singh & Raina, 2020). The positive psychology theory of Seligman's (2011) well-being model is a fresh approach that extends the focus beyond mitigating pathology to personal, societal, and organizational flourishing (Huppert, 2009). The positive well-being framework has been used for studying positive human qualities and flourishing life (Seligman's (2011); more comprehensive than earlier models, the model incorporated grand theories including the broaden-and-build theory of positive emotions (Fredrickson, 2004a), Franklin existential theory (Batthyany & Russo-Netzer, 2014), and self-determination theory (Ryan & Deci, 2017). Because of the lack of one comprehensive theoretical well-being model that used different assessments, Diener (2009c) called for examining well-being in different contexts such as work, with positive psychology appearing to predominate because of its potential benefits (Linley et al., 2006).

The broadening interest of practitioners and researchers in Seligman's (2011) positive well-being model has been determined to have many potential benefits for individuals, groups, and institutions (Gable & Haidt, 2005), especially for university teachers (Li, 2018) for developing scales to assess positive well-being (Butler & Kern, 2016). For instance, authors of multiple cross-cultural studies have assessed the psychometric properties of the PERMA profiler built on the positive well-being model. Butler and Kern (2016) and Wammerl et al. (2019) examined the construct validity of the PERMA profiler by comparing higher-order, single-factor, correlated factor, and bifactor models (see Wammerl et al., 2019). In addition, Pezirkianidis et al. (2019) ran first-order (correlated order) and higher-order models in the Greek cultural context. These studies on the PERMA profiler across various cultures lay the foundation and provide crucial psychometric information for current research. However, to the best of our knowledge, there are no studies validated with university teachers and using measurement invariance. Further, there is no research on the PERMA profiler's psychometric properties in the Amharic language or an African cultural context. Thus, for this research, we examined the Ethiopian Amharic version of Butler and Kern's (2016) PERMA profiler; following Schmitt and Kuljanin (2008), we examined the measurement invariances across gender, age, university type, and experience in teaching. Failure to establish measurement invariances hinders the sound interpretation of the data and the ability to demonstrate reliability and validity (Byrne & van de Vijver, 2010; Vandenberg & Lance, 2000).

The Present Study

The main purpose of this study was to test the construct validity of the PERMA profiler and its measurement invariances across gender (men, women), university types (research, applied, and general university), experience in teaching (below 5 years, between 6-10 years, and 11 years or above), and ages (ages 25–35, 36–45, 46 or above) and the effect of socio-demographic factors on PERMA well-being following the recommendations of Butler & Kern (2016) and Wammerl et al. (2019).

Socio-Demographic Variables and the PERMA Well-Being Model

Gender, age, experience. In the extant research findings, men have exhibited better psychological health than women, while women have shown greater psychological distress (Keyes, 2002; Tay et al., 2014), including in Africa (Vorster et al., 2005). Indeed, gender significantly affects positive emotion, relationships, meaning, and overall well-being (Ascenso et al., 2018). However, some research has indicated better scores for women on dimensions related to positive relationships (Ryff & Keyes, 1995). Regarding age, Singh et al. (2015) found a negative association with well-being.

In contrast, Ascenso et al. (2018) found no significant effects of age, gender, university type and years of experience in teaching on engagement or accomplishment. Although sex and experience significantly affected positive emotion and overall well-being. On the other hand, age was a significant factor in meaning in life and negative emotion (Ascenso et al., 2018). In sum, the actual results are inconclusive regarding associations between gender, age, experience, and well-being; thus, the topic warrants further investigation.

School level. School is a crucial environment for individuals' social development as students and teachers. Instructors spend most of their lives in school settings. Their experiences, institutional support, rules, and regulations affect their social development and powerfully influence their well-being and physical development (Singh et al., 2015).

Method

Population and Sample

We administered the PERMA profiler face-to-face to the study sample using a paper-and-pencil test for this study. After collecting the data, we randomly split the sample of university teachers into two groups to test the psychometric properties of the PERMA profiler and the other scales: 256 in sample 1 and 908 in sample 2. However, because of incomplete data, 47 questionnaires were excluded from sample 2; this left a completed questionnaire response rate of 95.3 %. This study, involving exploratory and confirmatory factorial analysis, was based on the proposed general guidelines about absolute sample size: (1) small ($n < 100$); (2) medium, $n =$ approximately 150; and (3) large

($n > 200$) (Strang, 2015). Table 1 presents the demographic information for all participants in both samples.

Table 1
Socio-demographic Characteristics of the Study Participants

Variables	Categories	Sample 1		Sample 2	
		N	Per cent	N	Per cent
Gender	Male	188	73.4	647	75.1
	Female	68	26.6	214	24.9
Age	25–35 Years	147	57.4	548	63.6
	36–45 Years	98	38.3	267	31.0
	46 Years and above	11	4.3	46	5.3
University Type	Research University	112	43.8	319	37
	Applied University	68	26.6	265	31
	General University	76	29.7	277	32
Experience in teaching	Below 5 Years	127	49.6	284	33
	6–10 Years	64	25.0	229	27
	11 Years and above	65	25.4	348	40

Note. Sample 1 (N = 256); sample 2 (N = 861)

Instruments

Target Measure

The PERMA profiler. The PERMA profiler measures positive emotion, engagement, relationships, meaning, and accomplishment and consists of 23 items; of these, 15 items measure profiler dimensions, and 8 are filler items (Butler & Kern, 2016), and we used the 15 PERMA items in this study. The items are rated on 10-point Likert scales (Pezirkianidis et al., 2019). The PERMA profiler has a good model fit, the best internal validity, cross-time consistency, and evidence for content, convergent, divergent, discriminant, and construct validity (Butler & Kern, 2016).

Criterion Measures

Psychological Well-Being Scale (PWBS). The PWBS was developed by Ryff and Keyes (1995) and is used to measure multiple aspects of psychological well-being. The scale consists of 42 items on six dimensions: autonomy, self-acceptance, personal growth, purpose in life, environmental mastery, and positive relations; 20 items are positively

worded and scored, 22 are negatively worded and scored, and 7 items delineate each subscale. All items are rated on scales that range between 1 = *strongly disagree* and 7 = *strongly agree*. The PWBS has shown excellent construct validity and reliability (Sasaki et al., 2020), with Cronbach's alphas ranging from 0.788 to 0.882; total scale reliability was $\alpha = 0.865$.

Satisfaction with Life Scale (SWLS). The SWLS, developed by Diener et al. (1985), is the most widely used instrument for measuring global life satisfaction. It is a five-item unidimensional scale, and each item is rated on a range between 1 = *strongly disagree*, and 7 = *strongly agree*. The SWLS had excellent construct validity and reliability in different studies ($\alpha = 0.858$).

Patient's Health Questionnaire of Depression and Anxiety (PHQ-4): The PHQ-4 measures anxiety and depression over the last 2 weeks; it is the most well-validated, reliable, and comprehensive scale for anxiety and depression screening (Kroenke et al., 2009). Two of the scale's four items measure anxiety (e.g., "feeling nervous, anxious, or on edge"), while the other two items measure depression (e.g., "feeling down, depressed, or hopeless"; Kroenke et al., 2009). In this study, overall Cronbach's alpha for the PHQ-4 was 0.880 (anxiety: $\alpha = 0.836$; depression: $\alpha = 0.800$).

The Loneliness Scale (LS-3): The LS-3 is described as a three-item scale with a 4-point Likert response format developed by Hughes et al. (2004). The scale uses unidimensional coding (1 = *never*, 4 = *often*). The scale's construct validity was good (Hughes et al., 2004), and in this study, the overall reliability was 0.911.

Socio-demographic information. The university teachers were asked about their gender, age, university, and experience in teaching.

Procedures

The most important issue in research is ethics, and this study was granted an ethical approval letter (Ref. No. 26/2019) from the institutional review board of Szeged University. All participants gave voluntary agreement before participating in this study. The research followed all procedures, rules, and regulations of the international research code of ethics.

Adaption, Translation, and Validation of the PERMA profiler

Well-being constructs and theories grounded in the PERMA profiler predominantly reflect Western, North American, and Asian realities, but cross-cultural validation and adaptation have vital roles for generalizability of an instrument across groups and are appropriate only after measurement equivalence has been confirmed (Davidov et al., 2018). Hence, the PERMA profiler was translated into the Ethiopian Amharic language by a bi-lingual expert at a university and by a professor of psychology to check content knowledge. These translators are bi-lingual experts with long years of teaching and research experience. Their work was followed by a back-translation procedure (from English to Amharic and from Amharic to English) to test the accuracy of the translated

content. After the translation of the scales, the questionnaires were administered to the university teachers.

Data Analysis

We used IBM SPSS 25.0 and IBM Amos software version 26.0 for statistical analysis to test the study hypotheses.

Reliability

Cronbach's alpha (internal consistency; α) and the composite reliability (CR) coefficient were used to measure reliability for each PERMA profiler sub-scales and total well-being. Evidence indicated acceptable reliability. Values higher than 0.90 indicate excellent internal reliability, values ranged 0.70–0.80, good (0.80–0.90), and values higher than 0.90 indicate excellent internal consistency (George & Mallery, 2020; Hair et al., 2019; Kline, 2016).

Convergent, Divergent and Discriminant validity

Construct validity (positively associated with similar constructs) and divergent validity (negatively correlated to opposite constructs or non-correlated) was assessed by examining Pearson's correlations between PERMA Profiler well-being scores and other theoretically relevant outcomes, where suggested the standard cut-points of correlational coefficients suggested by Schober et al., (2018), where negligible ranged 0.00–0.10, weak correlation (0.10–0.39), moderate correlation (0.40–0.69), strong correlation (0.70–0.89) and very strong correlation (0.90–1.00), respectively. Convergent validity included self-reported psychological well-being and life satisfaction, whilst divergent validity measures anxiety, depression, and loneliness. In addition, convergent and discriminant validity were assessed using the Average Variance Extracted (AVE) and the Maximum Shared Variance (MSV). Constructs that have AVE values higher than 0.5 demonstrate good convergent validity. Moreover, factors whose AVE is higher than their MSV are characterized by a good discriminant validity (Hair et al., 2019).

Factorial Analysis

The researchers used both exploratory and confirmatory factor analysis to test the construct validity of the PERMA profiler (Seligman, 2011). To examine exploratory factor analysis, robust maximum likelihood for factor extraction and varimax were used along with Kaiser normalization rotation. Regarding the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy, Kaiser (1974) recommended the following cut-points: excellent = 0.90 and above, very good = 0.80–0.89, acceptable (moderate) = 0.70–0.79, mediocre or average = 0.60–0.69, miserable or inadequate = 0.50–0.59, and unacceptable = 0.50. To further analyze the structure of the PERMA profiler, we performed confirmatory factor analyses (CFA) using Seligman's five blocks (Butler & Kern, 2016) and then compared

four model alternatives as in earlier studies on well-being (e.g., Wammerl et al., 2019 in Germany):

Model 1: We first examined the Butler and Kern (2016) original inter-correlated five-factor PERMA model.

Model 2: A bifactor model helps examine a fit mismatch between a unidimensional and multidimensional model (Immekus & Imbrie, 2008). These models are plausible for higher-order models (Wammerl et al., 2019), and they are highly credible for extensive data; they accurately describe the given data structure in CFA (Brown et al., 2011; Immekus & Imbrie, 2008; Reise et al., 2007).

Model 3: The single-factor model included a single variable for each of the five core pillars of the PERMA model to test a general well-being factor against the dimensional factor structures (Butler & Kern, 2016; Wammerl et al., 2019).

Model 4: For the higher-order model, we then added a second-order well-being factor whose effect was fully mediated by the five PERMA factors (Wammerl et al., 2019).

In addition, in explaining our CFA models, we disregarded the chi-square test (χ^2) owing to the oversensitivity of sample size based on the suggestion of Barrett (2007) and Steiger (2007) and instead used the most globally reported goodness-of-fit indices: Tucker-Lewis index (TLI), comparative fit index (CFI), and root mean square error of approximation (RMSEA) and information criteria such as the Akaike information criterion (AIC); using the following cut points for RMSEA: poor fit = greater than 0.10, mediocre fit = 0.08 to 0.10, good fit = 0.05 to 0.08, close fit = 0.01 to 0.05, and exact fit = 0.00 (Hu & Bentler, 1999). For groups of 10 to 20, Hu and Bentler (1999) suggested RMSEA cut points of ≤ 0.08 for acceptable fit. For TLI and CFI, the recommended cut-points are the following: poor fit > 0.85 , mediocre fit = 0.85–0.90, acceptable fit = 0.90–0.95, close fit = 0.95–0.99, and exact fit = 1.00 (Hu & Bentler, 1999). In addition to goodness-of-fit indices, the information criteria such as the AIC and BIC are the most appropriate for model comparison and useful for selecting a good model (Hooper, Coughlan, & Mullen, 2008). Small values of AIC and BIC indicate good fitting of the model, and statistics also need a sample size of 200 to make their use reliable (Hooper et al., 2008).

Measurement invariance (MI)

We tested the measurement invariance of the PERMA Profiler separately across gender (men, women), university types (research, applied, and general university), experience in teaching (below 5 years, between 6–10 years, and 11 years or above), and ages (ages 25–35, 36–45, 46 or above) using the best fitting model created by the CFA. More specifically, we have tested configural, metric, scalar, and residual measurement invariance to ensure that factor structure and loadings are equivalent across multiple groups. The present study's MI of configural, metric, scalar and residual invariances used single, and multi-group CFA following Millsap (2011) and Putnick and Bornstein (2016) and arrived at the

following recommendation criteria: ΔTLI , 0 = perfect and ≤ 0.01 = acceptable, $\Delta RMSEA$, 0.015 for metric, scalar, and residual invariance (Chen, 2007; Putnick & Bornstein, 2016).

Results

Descriptive Statistics, Normality Distributions of the Study Variables

Table 2 shows the constructs' descriptive statistics (minimum, maximum, means and standard deviations), and the normality of distribution using kurtosis and skewness.

Table 2

Min, Max, Means, SD, and Kurt, Skew for the PERMA Profiler Well-Being

Variables	No of Items	Min.	Max.	Mean	SD	Kurt	Skew
Positive emotion	3	3.00	29.00	14.296	4.914	1.397	1.296
Engagement	3	3.00	30.00	14.137	4.494	1.843	1.070
Relationships	3	6.00	30.00	15.332	4.234	2.078	1.332
Meaning in life	3	3.00	30.00	14.786	4.406	1.538	1.126
Accomplishment	3	3.00	28.00	14.066	4.675	1.139	1.030
Life Satisfaction	5	10.00	34.00	22.526	3.485	1.166	-.776
PERMA	15	37.00	137.00	72.618	20.294	1.989	1.617
PWB	42	112.00	234.00	179.323	20.002	.216	-.059
Depression	2	.00	6.00	4.117	1.407	-.936	-.181
Anxiety	2	.00	12.00	4.096	1.501	1.404	.364
Loneliness	3	3.00	18.00	6.065	2.637	.472	.745

Note: SD = standard deviation; Min = minimum, Max = maximum, Kurt = kurtosis, Skw = skewness

Factor structure

Bartlett's test of sphericity was significant ($\chi^2(105) = 3425.940$, $p < 0.001$), indicating that it was appropriate to use the factor analytic model in this study. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was moderate for this study (0.776), with 81.317 % of the variance explained, indicating that the variables' relationships were moderate and acceptable. The eigenvalues for all 15 items exceeded 1.00.

Table 3*Exploratory Factor Analysis of the Five-Factor PERMA Solution (N = 256)*

Items	A score of factor loadings				
	1(21.28 %) ^a	2(24.70) ^a	3(18.03 %) ^a	4(10.91 %) ^a	5(6.39 %) ^a
R2	.969				
R3	.967				
R1	.937				
En2		.938			
En1		.929			
En3		.903			
P2			.905		
P1			.902		
P3			.880		
M2				.923	
M3				.915	
M1				.774	
A2					.938
A3					.802
A1					.773

Note: ^a % of variance explained in each factor loading. The factor analysis extraction method was maximum likelihood with a varimax rotation. All the factor loadings are above .50 and acceptable.

We evaluated the reliability of the five-factor PERMA profiler sub-scales (positive emotion, engagement, positive relationships, meaning in life, and accomplishment). The reliability coefficients of the PERMA profiler were a) positive emotion: $\alpha = 0.96$, CR = 0.96, b) engagement: $\alpha = 0.95$, CR = 0.95, c) positive relationships: $\alpha = 0.95$, CR = 0.95, meaning in life: $\alpha = 0.93$, CR = 0.93, and accomplishment: $\alpha = 0.95$, CR = 0.95. The results of this study indicated that the five core PERMA profilers are characterized by high levels of reliability or internal consistency. The other variables used for convergent (psychological well-being and life satisfaction) and divergent validity (anxiety, depression, and loneliness scales) demonstrated acceptable reliability (see Table 4).

Table 4

Reliability and Validity Indices for the PERMA Well-Being Dimensions

Variables	Convergent Validity								
	PERMA-positive well-being model								
	P	E	R	M	A	PERMA			
PR	.200**	.154**	.154**	.159**	.147**	.183**			
AU	.252**	.209**	.186**	.215**	.205**	.240**			
EM	.092**	.096**	.105**	.093**	.081*	.104**			
PG	.148**	.117**	.090**	.114**	.128**	.135**			
PLI	.229**	.211**	.180**	.195**	.191**	.226**			
SA	.251**	.212**	.188**	.220**	.207**	.243**			
PWB	.179**	.103**	.169**	.216**	.182**	.190**			
LS	.143**	.067*	.100**	.153**	.131**	.134**			
Divergent Validity									
Dep	-.261**	-.202**	-.230**	-.200**	-.323**	-.264**			
Anx.	-.197**	-.151*	-.190**	-.181**	-.273**	-.215**			
Lon	-.157*	-.140*	-.155*	-.143*	-.229**	-.179**			
Models	α /CR	AVE	MSV	P	E	R	M	A	
<i>P</i>	0.96/0.96	0.90	0.70	1					
<i>E</i>	0.95/0.95	0.87	0.58	0.46	1				
R	0.95/0.95	0.87	0.65	0.43	0.52	1			
M	0.93/0.93	0.81	0.69	0.87	0.87	0.87	1		
A	0.95/0.95	0.87	0.70	0.87	0.87	0.87	0.87	1	

Note: ***p < 0.001, A = accomplishment, Anx= anxiety, AU = autonomy, AVE = Average Variance Extracted; CR = Composite Reliability; Dep = depression, E = engagement in work and life, EM = environmental mastery, LS = life satisfaction, Lon = loneliness, MSV = Maximum Shared Variance; M = meaning in life, P = positive emotion, PG = personal growth, PLI = purpose in life, PR = positive relations with others, PWB = psychological well-being, SA = self-acceptance

Convergent, Divergent, and Discriminant Validity

The researchers evaluated the validity of the teacher well-being dimensions based on their respective scores in AVE and MSV (see Table 4). The results indicated that all the PERMA well-being subscales have convergent validity of ($AVE > .05$), which means that the corresponding items that compose each of the five factors correlate well with each other. The PERMA well-being subscales' discriminant validity was also tested since

their AVE values were higher than their MSV. Hence, the result of this study indicated that the subconstructs of the PERMA well-being subscales AVE was greater than MSV: for positive emotion (AVE=0.90 > MSV=0.70), engagement (AVE=0.87 > MSV=0.58), positive relationships (AVE=0.87 > MSV=0.65), meaning in life (AVE=0.81 > MSV=0.69), and accomplishment (AVE=0.87 > MSV=0.70), which suggests that each factor's variance is better explained by the corresponding items that mainly load on each factor.

In addition, convergent and divergent validity of the PERMA profiler subscales were further assessed by testing its correlation with other positive and negative measures. To explore the convergent validity with positive constructs (psychological well-being and life satisfaction) and with negative constructs to explore divergent validity (anxiety, depression, and loneliness) were used (See Table 4). We found weak and positive correlations between instead of the PERMA well-being model with the PWBS and the SWLS: $r = 0.190$ ($p < 0.01$) and $r = 0.134$ ($p < 0.01$), respectively. We also found negligible to weak correlations between the PERMA well-being model subscales and the PWBS and SWLS subscales. The PWBS (Lee et al., 2017) is the most widely used tool for measuring the convergent validity of the PERMA well-being model. Regarding the divergent validity, we compared the PERMA profiler to depression, anxiety, and loneliness scales and found negative associations ($r = -0.264$, -0.215 , and -0.179 , $p = 0.01$, and $r = -0.255$, -0.248 , and -0.228 ; $p = 0.01$, respectively).

Single and Multi-Group Confirmatory Factor Analysis (SGMGCA)

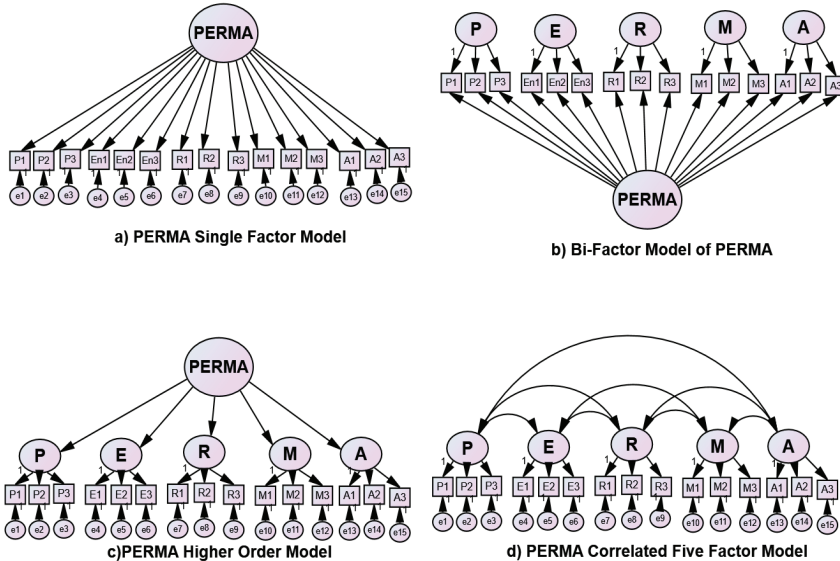
We arrived at a five-factor PERMA well-being model with 15 items derived from Butler and Kern (2016). We examined the theoretically driven PERMA well-being model using the correlated, single-factor, bifactor, and higher-order factor models following the global goodness-of-fit indices. Figures 1a–d clearly shows the single-factor, correlated, higher-order, and bi-factor PERMA well-being models. As, the Appendix 5 shows the goodness-of-fit findings for all four models; the five- PERMA correlated factor ($\chi^2(90) = 299.135$, $P < .001$, TLI= 0.983, CFI= .987, RMSEA= .056, CI [.050–.063], Bi-Factor Model ($\chi^2(75) = 306.412$, , $P < .001$, TLI=0.981, CFI= 0.986, RMSEA=.060, CI [.053–0.067], and Higher-Order Model ($\chi^2(85) = 338.262$, , $P < .001$, TLI= 0.981, CFI= .985, RMSEA= .059, CI [.052–.066] was found to be the best model fit. However, the same Table indicates that the PERMA single-factor model showed poor fit with the data ($\chi^2(104) = 4166.65$, $P < .001$, TLI = .719, CFI = .759, RMSEA = .1161, CI: .155–.167). In addition, all models showed statistically significant differences in the variances and factor loadings (see Appendix 3).

The inter-scale correlations for the five-factor model ranged from 0.71 to 0.81 (see Appendix 2), indicating strong relationships (Schober et al., 2018), and the standardized factor loadings were high as well (see Appendix 2). The bi-factor model showed the lowest factor loadings, with loadings below 0.72 to 0.88 of the 15 items (see Appendix 3). In conclusion, the five-factor PERMA model showed the best fit with the data and instead

fit with the original assumptions of the PERMA well-being theory (Butler & Kern, 2016; Wammerl et al., 2019).

Figure 1

The Four CFA Computing Models of the PERMA Profiler



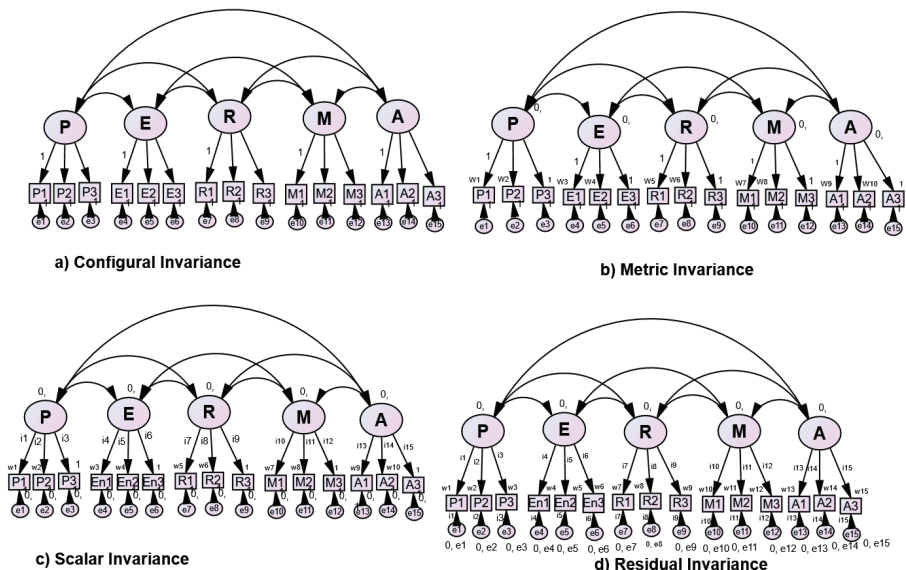
Note PERMA comparison models for this study: (a) single-factor model, (b) bifactor model, (c) higher-order factor model, and (d) five-factor correlated model.

Measurement Invariance Testing Results

We then examined the measurement invariance across gender, age, university type, and experience in teaching groups on the PERMA model (Appendix 6, Figure 2). The PERMA profiler was constructed independently across groups, and the model fit was examined before we tested MI.

Gender. The single-level PERMA well-being measurement model showed excellent model fit for both women ($\chi^2(81) = 150.578$, $P < .001$, CFI = .986, TLI = .982, RMSEA = .06) and men ($\chi^2(81) = 239.118$, $P < 0.001$, CFI = 0.987, TLI = 983, RMSEA = .05). After checking the independent fitness of the model, we performed the MI following the steps we outline below.

Figure 2
Four Stages of Measurement Invariance of the PERMA Profiler



Note. Measurement invariance of the PERMA profiler’s well-being across groups (gender, age, university type, and experience in teaching).

Step 1: The configural measurement invariance (CMI) model across gender showed the best model fit ($\chi^2(175) = 424.503, P < .001, CFI = .985, TLI = .982, RMSEA = .041[.036-.045]$) for the PERMA well-being model. In the second step, we determined metric measurement invariance (MMI) by the fit of the CMI model (Millsap, 2011). The MMI using the maximum likelihood test result showed the following values for the PERMA well-being model: $\Delta\chi^2(5) = 30.83, \Delta CFI = -.002, \Delta TLI = -.001, \Delta RMSEA = 0.002$. The third step of MI entails measuring the scalar measurement invariance (SMI), which is: $\Delta\chi^2(21) = 41.15, \Delta CFI = .002, \Delta TLI = .000, \Delta RMSEA = .000$. That is, the constrained factor loadings and the items intercept were equal for the two sexes. Based on the scalar variance result, we measured the residual measurement invariance in the fourth step and found $\Delta\chi^2(14) = 33.77, \Delta CFI = .001, \Delta TLI = .000, \Delta RMSEA = .001$. Therefore, we can conclude that the PERMA profiler measured all variables equally, irrespective of gender.

Age. The age of university teachers in between 25–35, 36–45, 46, and more, among the three age categories showed the best model fit to the data, ($\chi^2(80) = 155.52, P < .001, CFI = 0.991, TLI = .988, RMSEA = 0.04 [.032-.051]$), ($\chi^2(80) = 262.33, P < .001, CFI = .968, TLI = .958, RMSEA = .05 [.080-.105]$) and ($\chi^2(80) = 140.066, P < .001, CFI = .959, TLI = .946, RMSEA = .129 [.093-.164]$) for the PERMA well-being model, respectively. From the above findings of the RMSEA, the teachers 46 and above age showed not a good fit; however, the CFI and the TLI results are acceptable. We examined MI group

differences between the five-factor PERMA model across age categories in the measurement invariance stages; the configural invariance test yielded sufficient fit to the data at the correlated order factor, $\chi^2(240) = 560.342$, $P < .001$, CFI = .979, TLI = .973, RMSEA = .039 for the PERMA well-being model. As displayed in Table 6, the metric invariance test scores across age were invariant: $\Delta\chi^2(20) = 28.22$, $\Delta\text{CFI} = .000$, $\Delta\text{TLI} = -.001$, $\Delta\text{RMSEA} = .001$. In the third step of MI, the more restrictive model constrained the item intercepts, and we then calculated the SMI factor loadings: $\Delta\chi^2(28) = 176.11$, $\Delta\text{CFI} = .010$, $\Delta\text{TLI} = -.008$, $\Delta\text{RMSEA} = -.006$, which indicated that the item intercept and the factorial loadings are the same for the three age categories on the PERMA well-being model. The residual invariance (constrained item intercept, factor loadings, and strict measurement invariance) fitness indices to check the model across the age groups of five PERMA well-being models showed excellent fit to the data: $\Delta\chi^2(2) = 115.53$, $\Delta\text{CFI} = .008$, $\Delta\text{TLI} = .008$, $\Delta\text{RMSEA} = -.005$.

University type. The PERMA five-factor correlated model showed an excellent fit to the data regarding university type (research, applied, or general) at a single factor level ($\chi^2(80) = 234.845$, $P < .001$, CFI = 0.968, TLI = .957, RMSEA = .078[.067–.082], ($\chi^2(80) = 180.70$, $P < .001$, CFI = .984, TLI = .979, RMSEA=.069[.056–.082], and ($\chi^2(81) = 123.30$, $P < .001$, CFI=.990, TLI = .987, RMSEA = .043[.027–.058] respectively. The PERMA five-factor correlated model also fits with the data regarding university type at all four MI stages.

Experience in teaching. University teachers' years of teaching experience (fewer than 5 years, 6–10 years, and 11 years or more) showed an excellent fit to the data (see Appendix 6), as did MI on the configural, metric, scalar, and residual tests. The strict model (residual) was achieved, and all item loadings, intercepts, and residual variances were equivalent or equal across the three levels of experience in teaching.

Path Analysis

Gender had a negative and significant direct effect in the PERMA well-being model ($\beta = -0.095$ [95 % bootstrap CI: -0.158 to 0.030], $p < 0.01$), as shown in Table 7. We also found significant positive and direct effects of age ($\beta = 0.433$ [95 % bootstrap CI: 0.359 to 0.502], $p < 0.001$) and experience in teaching ($\beta = 0.065$ [95 % bootstrap CI: 0.006 to 0.124], $p < 0.05$) in the PERMA well-being model, respectively. However, university type had no direct effect on PERMA well-being ($\beta = 0.014$ [95 % bootstrap CI: -0.038 to 0.065], $p = 0.589$) (see Table 5).

Table 5
Path Analysis Bootstrapping Results (N = 861)

Outcome Variable	Path Model	Direct Effect	Bootstrap 95 % CI			
			Beta (β)	LBC	UBC	P
PERMA	←	Gender	-.095	-.158	-.030	.005
PERMA	←	Age	.433	.359	.502	.000
PERMA	←	University type	.014	-.038	.065	.589
PERMA	←	Experience in teaching	.065	.006	.124	.031

Note: CI = confidence interval, LBC = lower bound, UBC = upper bound.

Discussion and Implications

For a century, practitioners and researchers in various disciplines have primarily examined well-being by focusing on its pathological aspects (Spilt et al., 2011) and assessed it using multiple scales (Gallagher & Lopez, 2019). However, the scientific study of positive psychology and well-being has recently undergone dramatic expansion because of its positive outcomes for individuals, organizations, and societies (Seligman & Csikszentmihalyi, 2000). For this study, following Butler and Kern (2016) and Wammerl et al. (2019), we conducted further psychometric validation of the five-factor PERMA profiler and tested the MI across gender, age, university type, and experience in teaching to assess positive psychological state and healthy functioning among university teachers in an Ethiopian setting. Specifically, we tested group differences across university type, experience in teaching, age, and gender using the best-fitted model (the correlated factor) compared with four competing models (single-factor, bifactor, correlated, and higher-order).

The PERMA profiler has the best factor loadings, excellent reliability, and construct validity of all the well-being scales tested in this study. In contrast to other studies, in which researchers found weak psychometric properties of the engagement subscale (Butler & Kern, 2016; Pezirkianidis et al., 2019), we found in this study that all five pillars showed moderate to high inter-item correlations (see Appendix 2). The Amharic version of the profiler adequately measured the multidimensional aspects of well-being among university teachers in East African Ethiopian culture.

Regarding the convergent and divergent validity of the Ethiopian Amharic version of the PERMA profiler (Butler & Kern, 2016), the related measures include five measures that are not included on the other scales we used in this study (PWBS, Ryff & Keyes, 1995 Environmental Mastery, Personal Growth, Positive Relations With Others, Purpose in Life, Self-Acceptance; PHQ-4, depression and anxiety, Kroenke et al., 2009; SWLS, Diener et al., 1985; and LS-3; Hughes et al., 2004). The PWBS and SWLS showed

positive correlations with the PERMA profiler dimensions and negative correlations with depression, loneliness, and anxiety, consistent with earlier research (Butler & Kern, 2016; Pezirkianidis et al., 2019; Wammerl et al., 2019). The divergent validity in this current study showed negative correlations with depression, anxiety, and loneliness, and this finding also supports Pezirkianidis et al. (2019). We also explored another method to check convergent, divergent and discriminant validity and proved the PERMA profiler was valid. Overall, the Ethiopian, Amharic-language version of the PERMA profiler correlated well with the other well-being, life satisfaction, and psychological health status scales; the AVE is greater than 0.05, and AVE was less than MSV, which we used with a sample of Ethiopian university teachers.

A series of measurement invariance tests must be conducted for cross-cultural validation and firm conclusions (Millsap, 2011; Putnick & Bornstein, 2016; Vandenberg & Lance, 2000) tests of group mean differences, invariance of structural parameter estimates, and for this current study, we tested MI with a correlated factor model. We found similar factor loadings for all models, and we used the PERMA five-factor model for MI concerning gender, age, university type, and experience in teaching using single- and multi-factor CFA.

CFA with four competing models indicated a good fit of the PERMA profiler to the correlated factor (Seligman, 2011), bifactor, and higher-order (Wammerl et al., 2019) factor models. Additionally, the goodness-of-fit indices were compared with the findings from other validation studies (Butler & Kern, 2016; Pezirkianidis et al., 2019; Wammerl et al., 2019). Based on the findings, the five-dimension model (positive emotion, engagement, relationships, meaning in life, and accomplishment) of the PERMA profiler was the most suitable for assessing the Ethiopian university teachers' well-being across subgroups: gender (male, female), age (25–35, 36–45, 46 and above), university type (research, applied, general), and experience in teaching (5 years or fewer, 6–10 years, 11 years or more).

This present study examined four competing models based on the best-fitted model (the correlated factor model): single-factor, bifactor, correlated factor, and higher-order factor and tested measurement invariance with the PERMA profiler across groups of university teachers in Ethiopia. One possible drawback of this study is that we only studied university teachers, and future researchers could examine secondary and primary school teachers.

Furthermore, a study in Africa showed that culture, economic system, religion, ethnicity, kinship system, marriage, gender, age, education, employment and institutional practices played a pivotal role in the well-being of employees (Bonthuys et al., 2011)SD=13.28. Therefore, future studies should take the opportunity to examine these basic and important demographic variables using multi-variate analysis by taking cross-cultural samples.

Finally, the present study should offer a practical intervention in the well-being of university teachers using positive psychology theory (Seligman, 2011), COR theory (Hobfoll, 2002), and a broaden-and-build approach (Fredrickson, 2004). In addition, the results have some implications for the effectiveness of university managers. For example, Li (2018)

and (Zewude & Hercz, 2021) pointed out that university leaders or managers can enhance teachers' well-being by increasing their meaning in life and applying positive psychology.

Conclusion

Besides acknowledging that an Amharic version of the PERMA profiler in Ethiopian higher education settings is psychometrically sound, reliable, valid, and invariant using multi-modal CFA model comparisons. This study also offers the scientific community a sophisticated validated scale exclusively intended to assess university instructors' positive psychological states.

Furthermore, this research employed multi-modal model compressions (single factor, bifactor, correlated factor, higher-order factor), single group and multi-group CFA, and measurement invariance for university instructors of the PERMA profiler. Besides, it was conducted by the university instructors by taking large-scale data from the diverse Ethiopian higher education system. This study was also triangulated using various recommended sophisticated statistical methods to ensure the psychometric properties of the PERMA profiler.

Data Availability Statement

The data sets generated and analyzed during the current study are available from the corresponding author, who is willing to share with the journal.

Declarations

Ethical Approval

All procedures performed in studies involving human participants followed the institution's ethical standards and the 1964 Declaration of Helsinki.

Informed Consent

Informed consent was obtained from all participants included in the study.

Conflict of Interest

The authors declare no potential conflicts of interest concerning this original research, authorship, and publication of this article.

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Appendices

Appendix 1

The PERMA Profiler Questionnaire for Both English and Amharic Version

Block	Items	Original English Version	Amharic Version
Block 1	A1	How much of the time do you feel you are making progress towards accomplishing your goals?	ግቦችን ለማሳካት ምን ያህል የጊዜ ሂደት እንደወሰደበዎት ይሰማዎታል?
	E1	How often do you become absorbed in what you are doing?	ምን እየሰሩ ነዉ፤ምን ያህል ጊዜ ሙሉ በሙሉ በስራ ተጠምደዋል?
	P1	In general, how often do you feel joyful?	በአጠቃላይ ፤ምን ያህል ጊዜ ደስታ ይሰማዎታል?
	A2	How often do you achieve the important goals you have set for yourself?	ለራስዎ ያስቀመጧቸዉን በጠማ አስፈላጊ ግቦች በምንያክል ጊዜ ያሳካሉ?
Block 2	M1	In general, to what extent do you lead a purposeful and meaningful life?	በአጠቃላይ ዓላማ እና ትርጉም ያለዉ ህይወት የሚመሩት እስከምን ድረስ ነዉ?
	R1	To what extent do you receive help and support from others when you need it?	በሚፈልጉት ጊዜ ከሌሎች ምን ያህል ድጋፍ ና እገዛ ያገኛሉ?
	M2	In general, to what extent do you feel that what you do in your life is valuable and worthwhile?	በአጠቃላይ በሕይወትዎ ውስጥ የሚያደርጉት ነገሮችርጉም ያለው? እንደሆነ እስከ ምን ድረስ ይሰማዎታል
	E2	In general, to what extent do you feel excited and interested in things?	በአጠቃላይ እስከ ምን ድረስ ደስታ ና የነገሮች ፍላጎት እንዳለዎት ይሰማዎታል
Block 3	P2	In general, how often do you feel positive?	በአጠቃላይ ምን ያህል ጊዜ አውንታዊ ስሜት ይሰማዎታል
	A3	How often are you able to handle your responsibilities?	ምን ያህል ጊዜ ኃላፊነቶችን መወጣት ይችላሉ
	E3	How often do you lose track of time while doing something you enjoy?	የሚወዱትን ነገር ሲያደርጉ ምን ያህል ጊዜዎን ያጠፋሉ
	R2	To what extent do you feel loved?	ምን ያህል እንደተወደዱ ይሰማዎታል?
Block 4	M3	To what extent do you generally feel you have a sense of direction in your life?	በአጠቃላይ ምን ያህል ሕይወትዎን የመምራት ስሜት እንዳለዎት ይሰማዎታል?
	R3	How satisfied are you with your personal relationships?	በግል ግንኙነትዎ ምን ያህል እርካታ ይሰማዎታል?
	P3	In general, to what extent do you feel contented?	በአጠቃላይ ምን ያህል እርካታ ይሰማዎታል?

Scoring Block	Original-English		Amharic Version	
	0	10	0	10
1	Never	always	በጭራሽ	ሁልጊዜ
2	not at all	completely	በጭራሽ	ሙሉ በሙሉ
3	Never	always	በጭራሽ	ሁልጊዜ
4	not at all	completely	በጭራሽ	ሙሉ በሙሉ

Note. P1-P3 = positive emotion factor; E1-E3 = Engagement factor; R1-R3 = positive relations factor; M1-M3 = Meaning in life factor; A1-A2 = Accomplishment factor.

Appendix 2

Standardized Factor Loadings for the Single Factor, Bi-Factor, Higher Order Factor and Correlated Factor Models on the PERMA Well-Being Model

Sub dimension	Items	Single Factor Model	Bi-Factor Model	Higher order Factor	Correlated Factor Model				
					P	E	R	M	A
Positive Emotion	P1	.89	.87	.931	.96				
	P2	.90	.88	.952	.95				
	P3	.89	.88	.956	.93				
Engagement in work and life	E1	.82	.78	.957		.96			
	E2	.75	.74	.901		.90			
	E3	.77	.76	.933		.93			
Relation with others	R1	.84	.83	.929			.93		
	R2	.83	.82	.940			.94		
	R3	.83	.81	.923			.92		
Meaning in life	M1	.84	.83	.907				.91	
	M2	.82	.81	.908				.91	
	M3	.81	.80	.886				.88	
Accomplishment	A1	.83	.82	.885					.96
	A2	.86	.85	.956					.96
	A3	.86	.86	.962					.89

Correlation between the latent variables

Positive Emotion	1	.71**	.79**	.79**	.81**
Engagement		1	.70**	.68**	.73**
Relation with Others			1	.76**	.73**
Meaning in life				1	.77**
Accomplishment					1

Note. **p < 0.01, P = positive emotion, E = engagement in work and life, R = relation with others, M = meaning in life, A = accomplishment

Appendix 3

Variances and Factor Loadings of the PERMA Well-Being Models

	Single Factor Model			Correlated Factor Model			Bi-Factor Model			Higher Order Model		
	Estimate	C.R.	P	Estimate	C.R.	P	Estimate	C.R.	P	Estimate	C.R.	P
e1(P1)	.609	18.670	***	.394	16.132	***	.399	16.402	***	.391	16.066	***
e2(P2)	.564	18.469	***	.275	13.700	***	.281	12.036	***	.275	13.655	***
e3(P3)	.539	18.474	***	.237	12.920	***	.221	9.469	***	.240	12.977	***
e4(E1)	.864	19.830	***	.192	10.208	***	.186	8.473	***	.196	10.337	***
e5(E2)	1.088	20.002	***	.485	16.643	***	.489	16.384	***	.482	16.571	***
e6(E3)	.989	19.901	***	.330	14.026	***	.334	13.135	***	.328	13.913	***
e7(R1)	.630	19.388	***	.300	14.472	***	.316	14.884	***	.301	14.435	***
e8(R2)	.656	19.480	***	.255	13.271	***	.239	10.628	***	.255	13.237	***
e9(R3)	.701	19.599	***	.321	15.048	***	.315	13.312	***	.321	14.992	***
e10(M1)	.734	19.525	***	.416	14.358	***	.446	14.177	***	.420	14.419	***
e11(M2)	.805	19.629	***	.434	14.442	***	.395	10.310	***	.432	14.407	***
e12(M3)	.893	19.723	***	.556	15.884	***	.554	14.351	***	.552	15.825	***
e13(A1)	.851	19.495	***	.199	11.096	***	.613	18.577	***	.610	18.091	***
e14(A2)	.619	19.067	***	.608	18.093	***	.213	8.595	***	.218	12.129	***
e15(A3)	.627	18.995	***	.218	12.207	***	.191	7.548	***	.198	10.969	***
PERMA	2.322	16.709	***				1.944	15.521	***	2.181	15.841	***
P				2.553	18.933	***	.413	9.281	***	.360	10.849	***
E				2.120	18.877	***	.726	12.693	***	.721	15.614	***
R				1.900	17.897	***	.359	9.585	***	.425	13.072	***
M				1.962	17.089	***	.299	7.063	***	.356	10.899	***
A				2.443	19.091	***	.301	7.130	***	.429	12.215	***

Note. *** $p < 0.001$, P1-P3 = P (positive emotion), E1-E3 = E (engagement in work and life), R1-R3 = R (relation with others), M1-M3 = M (meaning in life), and A1-A3 = A (accomplishment)

Appendix 4

The PERMA- Profiler Inter Item Pearson Correlation (N=861)

A3															1
A2													1		.922**
A1													1	.842**	.847**
M3												1	.680**	.690**	.696**
M2											1	.811**	.681**	.694**	.704**
M1										1	.823**	.798**	.670**	.683**	.711**
R3									1	.705**	.663**	.657**	.622**	.669**	.668**
R2								1	.873**	.708**	.677**	.645**	.641**	.669**	.675**
R1							1	.871**	.854**	.715**	.667**	.653**	.669**	.677**	.688**
En3					1	.651**	.634**	.641**	.598**	.596**	.610**	.654**	.664**	.672**	
En2				1	.838**	.627**	.610**	.602**	.580**	.581**	.596**	.623**	.660**	.646**	
En1			1	.863**	.893**	.664**	.639**	.628**	.626**	.616**	.634**	.676**	.691**	.700**	
P3			1	.639**	.636**	.641**	.742**	.739**	.722**	.729**	.715**	.708**	.707**	.759**	.767**
P2		1	.912**	.651**	.646**	.659**	.735**	.741**	.713**	.726**	.728**	.692**	.705**	.775**	.757**
P1	1	.883**	.890**	.665**	.648**	.662**	.742**	.719**	.696**	.724**	.704**	.684**	.749**	.739**	.745**
	P1	P2	P3	En1	En2	En3	R1	R2	R3	M1	M2	M3	A1	A2	A3

Note. **. Correlation is significant at the 0.01 level (2-tailed).

Appendix 5

Goodness-of-Fit Indices for the Four Competing PERMA Models

	Models	χ^2 (df)	χ^2 /df	TLI	CFI	RMSEA (90 % CI)	AIC	BIC
Model 1	Single-Factor Model	4166.65(90)*	46.30	.719	.759	.229 (.224—.235)	4226.65	4369.39
	Five-Factor Model	299.14(90)*	3.74	.983	.987	.056 (.050—.063)	379.14	569.46
Model 2	Correlated Model							
Model 3	Bi-factor Model	306.41(75)*	4.08	.981	.986	.060 (.053—.067)	396.41	610.53
Model 4	Higher-Order Model	338.26(85)*	3.98	.981	.985	.059 (.052—.066)	408.26	574.80

Notes: * $p < 0.001$, Akaike information criterion, Bayes information criterion, CFI = comparative fit index, RMSEA = root mean squared error of approximation, TLI = Tucker-Lewis index.

Appendix 6

Measurement Invariance of the PERMA Profiler Across Gender, Age, University Type, and Experience in Teaching (N=861)

Model	Gender	$\chi^2(df)$	χ^2/df	TLI	CFI	RMSEA	Comparison	$\Delta\chi^2(df)$	ΔTLI	ΔCFI	$\Delta RMSEA$
Gender	Male (n = 647)	239.118(81)*	2.95	.983	.987	.055					
	Female (n = 214)	150.578(81)*	1.86	.982	.986	.064					
	M1: Configural	424.50(175) *	2.42	.982	.985	.041					
	M2: Metric	393.67(170) *	2.31	.983	.987	.039	M1	30.83(5)	-.001	-.002	.002
	M3: Scalar	434.82(186) *	2.33	.983	.985	.039	M2	41.15(21)	.000	.002	.000
	M4: Residual	468.58(200) *	2.34	.983	.984	.040	M3	33.77(14)	.000	.001	-.001
	25-35 Years (n = 548)	155.52(80)*	1.94	.988	.991	.042					
	36-45 Years (n = 267)	262.33(80)*	3.28	.958	.968	.092					
Age	46 Years & above (n = 46)	140.067(80)*	1.75	.946	.946	.129					
	M1: Configural	560.34(240) *	2.33	.973	.979	.039					
	M2: Metric	588.56(260) *	2.26	.974	.979	.038	M1	28.22(20)	-.001	.000	.001
	M3: Scalar	764.67(288) *	2.88	.966	.969	.044	M2	176.11(28)	-.008	.010	-.006
	M4: Residual	880.20(290) *	3.03	.958	.961	.049	M3	115.53(2)	.008	.008	-.005
	Research University (n = 319)	234.84(80) *	2.93	.957	.968	.078					
	Applied University (n = 267)	189.70(80) *	2.26	.979	.984	.069					
	General University (n = 277)	123.30(81) *	1.52	.987	.990	.043					
University type	M1: Configural	538.70(240) *	2.25	.975	.981	.038					
	M2: Metric	560.76(260) *	2.16	.976	.981	.037	M1	22.06(20)	-.001	.000	.001
	M3: Scalar	705.91(291) *	2.43	.971	.973	.041	M2	145.15(31)	.005	.008	-.004
	M4: Residual	846.11(320) *	2.64	.966	.966	.044	M3	140.2(31)	.005	.007	-.003

Below 5 Years (n = 284)	197(80) *	2.46	.969	.976	.072		
6–10 Years (n = 229)	158(80) *	1.97	.978	.983	.065		
11 Years and above (n = 348)	161(80) *	2.01	.985	.989	.054		
Experience	M1: Configural	516.10(240) *	2.15	.978	.984	.037	
In teaching	M2: Metric	561.79(260) *	2.16	.978	.982	.037	M1
	M3: Scalar	612.88(291) *	2.10	.979	.981	.036	M2
	M4: Residual	646.77(290) *	2.23	.977	.979	.038	M3
							M4
							M5
							M6
							M7
							M8
							M9
							M10
							M11
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							M97
							M98
							M99
							M100

Notes: * p < 0.001. MI = measurement invariance, RMSEA = root mean squared error of approximation, TLI = Tucker-Lewis index; CFI = comparative fit index; Δ RMSEA = change root mean squared error of approximation, Δ TKI = change Tucker-Lewis index; Δ CFI = change comparative fit index; PERMA = PERMA well-being model.

PERMA modelio psichometrinės savybės ir matavimo invariacija Etiopijos aukštojo mokslo aplinkoje

Girum Tareke Zewude¹, Maria Hercz²

¹ Segedo universitetas, Edukologijos doktorantūros mokykla, 7 Góz skveras, H-6724 Segedas, Vengrija, girumtareke27@gmail.com

² Ervošo Lorando universitetas, Pradinio ir ikimokyklinio ugdymo fakultetas, Kiss János altb g. 40, H-1126, Budapeštas, Vengrija, hercz.maria@tok.elte.hu

Santrauka

Šiuo tyrimu siekta išbandyti amharų kalba parengtą daugiadimensio PERMA modelio versiją pagal Seligmano (2011) teoriją: tiriami penki universiteto dėstytojų teigiamos savijautos elementai: P (teigiama emocija, angl. *positive emotion*), E (įsitraukimas, angl. *engagement*), R (pozityvūs santykiai, angl. *positive relationships*), M (gyvenimo prasmė, angl. *meaning in life*) ir A (pasiekimai, angl. *accomplishment*). Tyrime analizuojama modelio faktorinė struktūra, patikimumas, konvergentinis, divergentinis ir diskriminantinis validumas, patvirtinamoji faktorinė analizė, matavimo pastovumas ir kelio analizė, naudojant 1117 universiteto dėstytojų duomenis. Atlikdami patvirtinamąją faktorinę analizę, išbandėme keturis konkuruojančius modelius (dviejų faktorių, aukštesnės eilės faktorių, vienos eilės faktorių ir koreliuotų faktorių modelius), tačiau koreliuotų penkių faktorių struktūra buvo geriausiai pritaikytas modelis ir naudotas dėl invariantiškumo. Rezultatai patvirtina, kad amharų kalba sudaryto PERMA modelio versija pasižymėjo priimtiniu patikimumu, geru konvergentiniu validumu su įvairiais teigiamais psichologiniais konstruktais (psichologine gerove ir pasitenkinimu gyvenimu) ir diskriminaciniu validumu su neigiamais kintamaisiais (nerimu, depresija ir vienišumu). Be pateiktų modelių palyginimo išvadų, koreliacinis faktorinis modelis buvo geriausiai pritaikytas invariantiškumo požiūriu ir atskleidė nuoseklumą, atsižvelgiant į lytį, amžių, universiteto tipą ir dėstyto patirtį. Be to, kelio analizė parodė, kad lytis neigiamai veikė, o amžius ir dėstyto patirtis teigiamai veikė universitetų dėstytojų PERMA gerovę.

Esminiai žodžiai: *dviejų faktorių modelis, patvirtinamoji faktorinė analizė, tiriamoji faktorinė analizė, aukštesnės eilės faktorius, matavimo invariantiškumas, PERMA modelis.*

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