Assessing College Students' Social and Emotional Strengths: A Cross-Cultural Comparison from Mexico, United States, and Spain

Michael J. Furlong* [iD]
University of California Santa Barbara, USA

José A. Piqueras [iD]
Miguel Hernandez University, SPAIN

Leticia Chacón-Gutiérrez [iD]
University De La Salle Bajío, MEXICO

Erin Dowdy [iD]
University of California Santa Barbara, USA

Karen Nylund-Gibson [iD]
University of California Santa Barbara, USA

Meiki Chan [iD]
University of California Santa Barbara, USA

Victoria Soto-Sanz [iD]
Miguel Hernandez University, SPAIN

Juan C. Marzo [iD]
Miguel Hernandez University, SPAIN

Tíscar Rodríguez-Jiménez [iD]
University of Zaragoza, SPAIN

Agustín E. Martínez-González [iD]
University of Alicante, SPAIN

Abstract: Endeavors supporting college students' positive psychosocial development are gaining attention and investment in various countries and social contexts. Higher education experiences provide new academic, social, and vocational advancement opportunities at a critical developmental stage. However, higher education can also cause distress due to the challenges and stressors present during this new stage of increased independence. The Social Emotional Health Survey-Higher Education (SEHS-HE) assesses the core psychosocial strengths of individuals transitioning from secondary schools into institutions of higher education (IHE) to aid campus student support services. The present study sought to extend the SEHS-HE research by examining its application with college student samples from Mexico (n = 4,207), United States (n = 1,638), and Spain (n = 1,734). Confirmatory factor analyses investigated the hypothesized SEHS-HE higher-order factor model. The Mexico sample returned an acceptable model fit, but the USA and Spain samples had a suboptimal fit; hence, we explored alternative models. A two-level structure had full invariance for all three samples. This study extends the current scholarship on the conceptual model and psychometric properties of SEHS-HE. The discussion focuses on implications for future research to enhance SEHS-HE in national and cross-national research and practice.

Keywords: *Covitality, higher education, measurement invariance, Social Emotional Health Survey.*

Introduction

The first onset of mental health difficulties is most prevalent in young people before age 24, particularly between the ages of 16 and 25, when students proceed to postsecondary institutions of higher education (IHE; Martin, 2010). The WHO World Mental Health International College student initiative project, is a cross-national study on the prevalence, incidence, and correlates of mental disorders among first-year college students in 19 colleges across eight countries, including Spain, Mexico, and the USA. Roughly one-third of first-year students reported symptoms consistent with diagnostic criteria of at least one anxiety, mood, or substance disorder (Auerbach et al., 2018). Colleges worldwide are challenged increasingly by the ascending rates of mental health disorders that diminish students' quality of life and derail persistence and progress toward degree completion. To effectively identify and serve students with mental health needs

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* **Corresponding author:**
Michael J. Furlong, University of California Santa Barbara, USA. ✉ mfurlong@ucsb.edu

is a pressing concern for higher education institutions worldwide (National Academies of Sciences, Engineering, and Medicine, 2021).

Population-based public health approaches are recommended to address unmet mental health needs beginning with universal assessment or screening (Dowdy et al., 2010). Current screening measures to identify and monitor psychological distress have primarily concentrated on distress symptoms. However, recent research highlights the importance of assessing complete mental health, including distress symptoms and student strengths (Furlong et al., 2014). Such screening may be crucial within higher education settings as positive traits can mediate the effect of a wide variety of stressors students may encounter in college and help students adapt to a demanding environment and psychological distress. The *Social Emotional Health Survey-Higher Education* (SEHS-HE; Furlong et al., 2017) attempts to fill this assessment gap and provides insights into college students' psychological strengths and competencies.

The current study evaluated the psychometric properties and validation evidence of the factor structure of the SEHS-HE with cross-national samples. It examined the SEHS-HE in three different sociocultural contexts to broaden its potential applications across various contexts and for international research. Specifically, the current study evaluated the SEHS-HE factor structure with new college-age student samples from Mexico (Spanish), the United States Pacific coast region (English), and Spain (Spanish). Additionally, this study examined SEHS-HE measurement invariance to evaluate factorial integrity across the three samples. The analyses also contributed to a better understanding of the SEHS-HE's covitality principle grounded in a complete mental health framework.

Literature Review

The Emotional Well-being Challenge

Entry into college is a keystone life period as individuals transition into adulthood. This life stage requires increased personal autonomy and adaptation to academic performance expectations while balancing social and economic needs. Although college life offers many opportunities, surveys also recognize that college students face unique personal challenges. Some students experience diminished self-esteem manifesting as the imposter syndrome (Holden et al., 2021; Parkman, 2016). College students also report distressing emotional experiences such as hopelessness (31% felt hopelessness, past month) and loneliness (40% felt very lonely, past month; American College Health Association, 2018). The WHO World Mental Health International College Student Initiative has emphasized the high need for mental health care among university students (Auerbach et al., 2018; Ballester et al., 2020; Ebert et al., 2019). While IHEs' are deeply invested in addressing the need of students with mental health disorders, they increasingly recognize the benefits of fostering student personal strengths and wellness, mainly as they facilitate timely degree completion. There is a critical need for measures that IHEs can efficiently use to monitor inter/intrapersonal strengths in this context.

Addressing Challenges with Social Emotional Assessments

There is broad recognition for validating college students' positive psychological skills and mindsets measures. A USA National Commission on Social, Emotional, and Academic Development (NCSEAD) report identified factors empirically linked to student success (Berman et al., 2018; Gutman & Schoon, 2013). The empirical evidence supporting the conclusions and recommendations emerging from the NCSEAD report is grounded in studies examining the associations between specific academic mindsets and college persistence and progress—College Academic Self-Efficacy Scale (Solberg et al., 1993), Overall Sense of Belongingness Scale (Johnson et al., 2007), Motivated Strategies for Learning Questionnaire (Pintrich & De Groot, 1990), and Grit-Perseverance of Effort Subscale (Duckworth et al., 2007). Other existing measures (e.g., College Persistence Questionnaire; Davidson et al., 2015) assess some relevant psychological mindsets (e.g., social integration, motivation to learn, collegiate stress, and academic self-efficacy) but are too long for use as universal assessments across many institutions.

Many primary and secondary schools implement programs and services fostering students' social-emotional mindsets, skills, and development (Hamilton et al., 2019). Despite this broad interest, Taylor and Hamilton (2019) caution that there is a pressing need for additional research to carefully validate measures of inter/ intracognitive traits, with unstandardized behavioral observations reported as being the most used form of assessment. Even less research has been conducted at the IHE level to develop and validate measures, despite the need for developmentally appropriate measures. Supported by the Aspen Institute's call for enhanced SEL assessment resources, the RAND Corp. developed the Education Assessment Finder (EAF). Among the cataloged measures, there are only five EAF measures appropriate for postsecondary education: Clifton Strengths Finder, Multidimensional Self-Concept Scale (MDSCS), Personal Skills Map, Sedcaek Noncognitive Questionnaire, Bar-On Youth Version, and Well-being Indicator Tool for Youth. None of these measures provide IHEs with what they most need—an efficient, comprehensive measure of students' strengths validated with the same sample. The Clifton (177 items) and Personal Skills Map (244 items) are too long. The Bar-On (short, 30 items) and MDSCS (29 items) have fewer items than other measures, but they are not in the public domain. These measures do not provide comprehensive coverage for postsecondary students, are not validated for diverse samples to predict degree persistence and progress, and are not designed to provide information at the institution system level (e.g., climate indices).

The relationship between social-cognitive factors and a successful college experience is recognized. A Mathematica Policy review for the Gates Foundation (College Segmentation Initiative) examined the role of intra/interpersonal competencies (noncognitive factors [Sato et al., 2015] or mindsets [Farruggia et al., 2018]) in supporting college students' success. This review discussed a framework of behaviors related to success, including broad dispositions, beliefs, specific motivations, and future identity. Broad dispositions were behaviors related to conscientiousness, such as self-control, responsibility, hard work, persistence, and achievement orientation. The beliefs investigated were a sense of belonging, academic self-efficacy, and a growth mindset (a student's belief that intelligence is incremental). The framework also explored specific motivations for success, including utility goals and values, intrinsic goals and interests, and prosocial goals and values. Researchers named future identity, such as having a positive image or idea of who they will be in the future, as a factor in student success. The National Academies of Sciences, Engineering, and Medicine's (NASEM, 2017) Committee on Assessing Intrapersonal and Interpersonal Competencies examined the role of these competencies on student success and graduation. Competencies included "a range of attitudes, behaviors, beliefs, and dispositions within the individual student and may also be influenced by college environments and contexts" (p. 2). The critical competencies proposed for further investigation are behaviors related to conscientiousness, academic self-efficacy, growth mindset, intrinsic goals and interests (self-awareness), positive future self (optimism), prosocial goals and values, sense of belonging (peer, family, and institutional), and utility goals and values. The SEHS-HE conceptual model, with its grounding in social emotional learning (SEL), is aligned with the competencies found to be associated with student success.

Measuring College Students' Social and Emotional Assets

A substantive limitation of existing measures used in college progress and persistence research is that they often are investigated individually, not simultaneously. For example, there is literature examining the contributions of gratitude (Mofidi et al., 2014; Wood et al., 2010), self-efficacy (Cambridge-Williams et al., 2013), and institutional belongingness (Knekta & McCartney, 2018) to academic success and developmental well-being. Recently, there has been an interest to move beyond this siloed research approach by examining the combinatorial influences of factors impacting successful adaptation to college and degree completion (Farruggia et al., 2018). To the extent that a general construct is an essential component of forming and maintaining inter/intracognitive resources/assets, a measurement objective would be to examine the cross-construct factor structure of such measures. Previously, Jones et al. (2013) examined the combined factor structure of hope, gratitude, optimism, self-efficacy, and happiness with a sample of college students. The combined analysis of the 39 items returned factors for each measure, but with the removal of double-loaded items, only 20 items remained. This finding highlighted the substantial conceptual and psychometric challenges of measuring social and emotional constructs interdependently and highlighted measurement inefficiencies.

The SEHS-HE measurement model postulates that positive constructs develop with some degree of synchronicity. For example, a person experiencing a professor helping with a challenging math problem provokes a gratitude mindset. A student might experience gratitude when a professor provides support to solve a problem while simultaneously boosting their self-efficacy when they recognize, "Hey, I can do this!" The term *covitality* describes the multiplicative well-being effects of various positive social and psychological mindsets. When considering global well-being, the covitality principle describes the combinatorial benefits of multiple competencies and strengths in biology (Weiss & Luciano, 2015) and positive psychology/education (Furlong et al., 2014; Keyes, 2005). The Center for Social Emotional Learning's (CASEL) complementary perspective emphasizes balanced social and emotional measurement criteria. "It is not about whether the framework is exhaustive and includes all competencies but whether it is balanced enough to include major dimensions of SEL versus being focused on only a few dimensions" (Blyth et al., 2019, p. 3). A social-emotional measurement challenge is to retain a meaningful set of inter/intrapersonal domains while their theoretically expected high correlations do not return an over-determined measurement model.

Social Emotional Health Survey-Higher Education (SEHS-HE)

The SEHS covitality principle proposes that people build self-other cognitive dispositions as the life-long developmental process unfolds (Crisp & Turner, 2014). These dispositions foster positive development and protect against psychological distress. In addition, the covitality principle hypothesizes that these dispositions facilitate higher levels of coping, adaptation, and well-being (Jones et al., 2013). The covitality model conceptually links with self-determination theory, which proposes that development is a "natural, active process characterized by (an)…organic integration process" (Deci & Ryan, 2014, p. 41). Individuals are active creators and participants of their psychological development and shape their social cognitive competencies. Zachariah et al. (2015) commented that "…that these human strengths do not work in isolation, but that just as combining steel with concrete strengthens the foundations of a building, a combination of these strengths are needed to strengthen well-being and help resist some of the common issues of modern life" (p. 1). The covitality model hypothesizes that this developmental process is life-long, emerging in childhood and continuing through adolescence into the adult transition age of college students. The SEHS measure assesses psychosocial strengths based on a hypothesized higher-order model with four latent traits:

- *Belief in Self* domain (subdomains: self-efficacy, persistence, self-awareness),
- *Belief in Others* domain (subdomains: family coherence, institutional bonding, peers support),

- *Emotional Competence* domain (subdomains: cognitive reappraisal, empathy, self-regulation), and

- *Engaged Living* domain (subdomains: gratitude, zest, optimism),

- *Covitality* (higher-order latent construct).

The SEHS higher-order model is grounded in research showing that wellness indicators cluster. A higher number of social cognitive strengths across more domains are associated with fewer risk behaviors (e.g., less substance use), higher performance (higher GPA), and higher subjective well-being (Lenzi et al., 2015a, 2015b; Wiium et al., 2021).

Study Purpose and Literature Contribution Aims

Our work initially developed and validated the SEHS-Secondary (SEHS-S; Grades 7-12). There is now substantial validity evidence supporting the SEHS-S measurement model inclusive of covitality and subdomains for use with secondary school age students and predictive of critical educational outcomes across counties and subgroups, including California (Furlong et al., 2014, 2021; Hinton et al., 2021; You et al., 2014, 2015), Spain (Piqueras et al., 2017), Mexico (Gutiérrez, 2019), and other countries (e.g., Iida et al., 2019; Ito et al., 2015; Lee et al., 2016; Telef & Furlong, 2017; Xie et al., 2017). Nevertheless, there is much to learn about how to identify psychological strengths and distress efficiently and effectively among college students within a lifespan perspective and how to use this information to deploy appropriate resources. Few studies have examined mental health screening tools across diverse college student samples. There is a scarcity of research available for Spanish language forms (Piqueras et al., 2017), the second most spoken language worldwide. To date, there is no standard of practice regarding instrumentation measuring social-emotional health among college students. However, given the impact of positive psychosocial traits in all aspects of human and social development, it is crucial to build, modify, and validate instruments that support college students' flourishing and thriving well-being (NASEM, 2021). The SEHS-HE form could address these contribute to this research and IHE practice needs, but it is not yet extensively scrutinized—certainly not as much as the SEHS-Secondary form.

Further refinement and validation of the SEHS-HE could contribute to both science and practice. Conceptually covitality is a life-long developmentally relevant construct. Further validation of the SEHS-HE could provide an assessment resource aligned across secondary schools into higher education and insights into the covitality principle itself. Examining the SEHS-HE validity in three national contexts provides a broader examination of the measure's psychometrics and extends its possible applications to Spanish language institutions.

Methodology

Research Design

Between August 2016 and October 2017, monthly video conference meetings were used to complete survey preplanning: instrument review, translation of all measures, creating and piloting data collection, sampling plan. Coordination with each campus administration related to the specific procedures needed to solicit and invite student participation.

Data Collection

The survey administered in all three countries included the SEHS-HE and demographic questions. The survey administration procedures differed by institution and included the methods: (a) distribution of emails invitations from the campus institutional research office to a random sample of students, (b) emails to faculties heads requesting distribution of a survey link to students, (c) social-media announcements, and (d) classroom solicitations explaining the survey and requesting participation. In Spain, the survey was administered using the online data collection platform DetectaWeb (Piqueras et al., 2017) based on an online LimeSurvey ® format. In Mexico, a preprinted Scantron response format was used and administered in class settings. In the United States, an online Qualtrics ® format was used. Surveys were distributed, to students, at two universities. One campus used opportunity sampling. The Office of Institutional Research distributed the survey by email to a random sample of students at the second campus and managed two follow-up emails to non-responders. The survey response rate was 25%.

Participants

The participants in this study included 7,579 college students from Mexico (n = 4,207), the USA (n = 1,638), and Spain (n = 1,734). The human subjects institutional review board on each participating campus approved this study's research protocol.

Mexico Sample

The participants in this sample come from two institutes of higher education in Mexico, randomly split into two equal subsamples to perform the confirmatory and exploratory factor analyses. The majority of responses came from university 1 (79.8%). Most respondents were female (57.8%). The average age was 20.4 years, ranging from 16 to 53.

Two hundred and seventy-eight cases were removed because respondents stopped responding halfway through the survey, indicating that they withdrew consent.

USA Sample

The sample was from two institutions located on the USA Pacific coast. The sample included 62.1% identifying as female, 36.6% as male, and 1.2% as another gender identity. The students' sociocultural identification (they could select multiple options) was as follows: White (46.5%), Black (2.9%), Latinx (26.7%), East Asian (24.l%), South Asian (2.5%), Pacific Islander (2.6%), Middle Eastern (3.1%), American Indian/Alaskan Native (1.7%), Other identification (2.4%), and declined to state ethnicity (1.1%). College seniors made up most of the participants (30.5%), followed by juniors (27.8%), freshmen (26.9%), and sophomores (14.9%).

Spain Sample

The participants in this sample come from three higher education universities from the southeast of Spain (Miguel Hernandez University-UMH, University of Alicante-UA, and the Catholic University of Murcia-UCAM). The students' responses from the three universities were combined, randomly split into two equal samples to perform the confirmatory and exploratory factor analyses. Most responses came from UMH (74.6%), followed by UCAM (13.7%) and UA (11.7%). The respondents identified as male (39.6%) and female (60.4%). The average age of participants was 21.1 years (SD = 4.65), with a range of 17 to 59. Four hundred fifty-one participants stopped responding halfway through the survey indicating that they withdrew their consent. Only 23 of the remaining cases were removed from the dataset because they did not complete the SEHS-HE, making it challenging to impute reliable estimates of their missing responses.

Measures

The Social Emotional Health Survey–Higher Education

The SEHS-HE measures core psychosocial latent traits (Furlong et al., 2017). Its 36 items yield a hypothesized higher-order model, comprised of 12 first-order, four second-order latent traits, and a higher-order general factor called Covitality, referred to as the 1 (covitality) => 4 (domains) => 12 (subdomains) => 36 (items) model. The 12 first-order and four second-order factors are *Belief in Self* (which consist of self-efficacy, self-awareness, and persistence); *Belief in Others* (school support, peer support, and family support); *Emotional Competence* (emotion regulation, empathy; and behavioral self-control), and *Engaged Living* (gratitude, zest, and optimism). In its development with USA samples, Furlong et al. (2017) employed an incremental five-stage development process. The hypothesized factor structure had a good CFA fit, and there was complete invariance for males and females with small effect size differences on latent mean scores. Evidence supported the SEHS-HE total score's concurrent and predictive validity for students' subjective well-being (r = .72, r = .65, respectively) and psychological distress (r = −.56, r = −.45, respectively). The four-month stability coefficient for the SEHS-HE total Covitality score was .82, indicating it measures trait-like psychological constructs.

Translation. The Spanish versions of SEHS-HE were developed following the guidelines of the International Test Commission [Muñiz et al., 2013], using an iterative-translation method that began with several independent translations. The translation process was collaborative between authors from Mexico and Spain to adapt SEHS-HE into a common European and Mexican Spanish form. A joint committee composed of translators with knowledge of the Spanish language and culture and specialists in the field of assessment analyzed the adequacy of the adapted version.

Mental Health Continuum–Short Form

The Mental Health Continuum Short Form ([MHC-SF], Keyes, 2005) served as a criterion validity measure. It is a 14-item measure of global subjective well-being including emotional, psychological, and social components (Keyes, 2006). The question stem is, *During the past month, how often did you feel the following ways*: (a) an example item for emotional well-being is ...*happy*; (b) an example item for the psychological well-being is ...*that you liked most parts of your personality*; and (c) an example item for social well-being is, ...*that people are basically good*. Response options are as follows 0 = *never*, 1 = *once or twice*, 2 = *about once a week*, 3 = *2 or 3 times a week*, 4 = *almost every day*, and 5 = *every day*. The MHC-SF total scores reliability was acceptable for all three samples: Mexico (a = .83), USA (a = .91), and Spain (a = .90).

Data Analysis

Factor analyses were conducted in two stages using Mplus (Muthén & Muthén, 2017) and MplusAutomation in R (Hallquist & Wiley, 2018). First, a confirmatory factor analysis (CFA) estimated the fit of the SEHS-HE factor structure based on the previously tested 1=>4=>12=>36 CFA model (see, Arslan et al., 2020; Furlong et al., 2021). A full-sample CFA was conducted first, including all survey respondents (N = 7,579). Next, CFAs were run separately for each of the three countries. Then, a series of multigroup CFAs tested for measurement invariance across the three national groups. The testing process involved several steps investigating increasingly restrictive measurement invariance levels following the steps suggested by Putnick and Bornstein (2016). The four measurement invariance steps considered were: (a)

configural, equivalence of model form; (b) *metric* (weak factorial), equivalence of factor loadings; (c) *scalar* (strong factorial), equivalence of item intercepts or thresholds; and (d) *residual* (strict or invariant uniqueness), the equivalence of items' residuals or unique variances (Putnick & Bornstein, 2016).

Model Evaluation

A chi-square difference test assessed model fit comparing the change in fit after applying constraints. It is worth noting that the chi-square test is sensitive to sample size, and it can reject the model even if the fit is acceptable when the sample is sufficiently large (Cudeck & Browne, 1983). Thus, other fit indices suggested by Hu and Bentler (1999) assessed model fit: standardized root-mean-square residual (SRMR), comparative fit index (CFI; Bentler, 1990), and root-mean-square error of approximation (RMSEA; Steiger & Lind, 1980) with a 90 % confidence interval. SRMR was examined with a value lower than .08 desired. Values below .05 for the RMSEA indicate a good fit, and values below .08 reflect adequate fit. CFI values higher than .95 indicate an acceptable fit, and higher than .90 indicate adequate fit. The differences in CFI values between models should be smaller than or equal to .01, as suggested by Cheung and Rensvold (2002). The three countries were coded as 0 for Mexico, 1 for the USA, and 2 for Spain for data analyses.

Findings / Results

Data Screening

First, preliminary data screening was first performed using R. All item responses ranged from 1 to 6, suggesting no outliers in this total combined sample. Mardia's test evaluated multivariate normality for the 36 variables, and results were significant, indicating that the data were not multivariate normal. As a result, we used ML estimation with robust standard errors (e.g., MLR) since it is robust for normality violations (Satorra & Bentler, 1994). Additional data screening examined missing responses. The item with the most missing responses was one Zest subscale item (six observations, 0.3%), much lower than the recommended 10% (Bennett, 2001), or even as low as 5% (Schafer, 1999) to remain unbiased. Thus, missing data in this study is inconsequential given the relatively large sample size and low missing rate. Analyses proceeded as planned.

Analyses 1: Four-Level Model (1=>4=>12=>36)

Factor Structure. A confirmatory factor analysis (CFA) of responses from all three countries tested the fit of the four-level higher-order CFA structure of SEHS-HE uses the 1=>4=>12=>36 model. This four-level SEHS factor structure has been tested with good model fit for the SEHS-Secondary English (Furlong et al., 2021) and Spanish (Hinton et al., 2021) language forms, and a SEHS-HE Turkish language form (Arslan et al., 2020). The analysis yielded a satisfactory model fit. While the chi-square significant, $\chi2 = 9578.17$, $df = 578$, $p < .01$, all other fit indices fell within the recommended criteria, SRMR = .061, RMSEA = .045, 90% CI[.045, .046], CFI = .903. Thus, we concluded that there was evidence that the four-level model adequately fit the full sample data. As a next step in measurement invariance testing, three CFAs were conducted separately for each country. The four-level model adequately fit the data for Mexico sample, SRMR = .058, RMSEA = .044, 90% CI[.043, .045], CFI = .904. However, less satisfactory fit results were found for the Spain and USA samples. For USA, the chi-square test results were significant, $\chi^2 = 2555.72$, $df = 578$, $p < .01$, SRMR = .061, RMSEA = .046, 90% CI[.044, .048], and CFI fell slightly outside the recommended criteria CFI = .894. For the Span sample, the chi-square test results were significant, $\chi^2 = 3097.94$, $df = 578$, $p < .01$, SRMR = .071, RMSEA = .050, 90% CI[.048, .052], and CFI fell outside the recommended criteria CFI = .883.

Invariance Testing. Since the CFI for the Spain and USA samples fell relatively close to the recommended criteria of .90, analyses proceeded to measurement invariance testing. First, we tested configural invariance across the three countries. Invariance at the configural level indicates that the free and fixed loadings pattern is supported in three countries. However, identification issues emerged at this step, and the four-level model did not achieve invariance across the Mexico, USA, and Spain samples.

Analyses 2: Three-Level Model (4=>12=>36)

Factor Structure. Due to the inability to achieve stable models across all three countries with the 1=>4=>12=>36 model, a three-level (4=>12=>36) model was tested. Specifically, CFAs tested the second-order correlated model that structured each of the 36 items as indicators of the 12 traits and these 12 subscales loading to the four SEHS-HE constructs (i.e., belief-in-self, belief-in-others, emotional competence, and engaged living), without specifying the overall covitality factor. A CFA with the full sample provided adequate data-model fit statistics $\chi^2 = 9503.41$, $df = 576$, $p < .01$, CFI = .90, RMSEA = .045, 90% CI[.044, .046], SRMR = .060. Then, separate CFAs were conducted for each country. Like results of the four-level model, the analysis for the Mexico sample yielded satisfactory results, $\chi^2 = 5263.44$, $df = 576$, $p < .01$, CFI = .90, RMSEA = .044, 90% CI[.043, .045], SRMR = .057. For the USA group, all fit statistics fell within the recommended criteria except the CFI that still was slightly lower than the .90 threshold, RMSEA = .045, 90% CI[.043, .047], SRMR = .059, CFI = .897. For the Spain sample, there was adequate model fit with all fit statistics fell within the recommended criteria except the CFI, RMSEA = .050, 90% CI[.048, .052], SRMR = .070, CFI = .884.

Invariance Testing. Since the CFI for the Spain and USA samples were relatively close to the recommended criteria of .90, analyses proceeded to measurement invariance testing. We tested, in order, configural, metric, and scalar invariance across the three countries. The configural and metric tests met all the recommended criteria except the CFI statistics. The scalar test results did not yield satisfactory results, as both CFI and SRMR outcomes fell outside the recommended standards. Hence, measurement invariance was not established for the three-level (4=>12=>36) model.

Table 1. Standardized Factor Loadings for the Social Emotional Health Survey-Higher Education (SEHS-HE)

Subscale	Item	Loading
Self-Efficacy	Generally, I feel capable of overcoming obstacles.	0.81
	I will be able to achieve most of the goals that I have set for myself.	0.86
	I will be able to successfully overcome many challenges.	0.86
Persistence	I do not stop my work even if it is very difficult.	0.77
	I persist on tasks that I cannot immediately complete.	0.68
	I stay focused while studying despite distractions.	0.56
Self-Awareness	I can identify the motivations behind my actions.	0.65
	I recognize my moods and feelings.	0.76
	I have a good sense of why I have certain feelings most of the time.	0.73
Family Coherence	My family continues to love and support one another in tough situations.	0.84
	There is a sense of togetherness within my family.	0.94
	My family gets along well with each other.	0.79
School Support	Outside of my friends, there are other people on campus who care about my well-being.	0.62
	I feel like there is a strong feeling of togetherness on my campus.	0.69
	I feel like I belong at this university.	0.73
Peer Support	I have a friend at my college or university who cares about me.	0.72
	I have a friend who gives me the emotional support I need.	0.83
	I can talk to my friends about pretty much anything.	0.71
Cognitive Reappraisal	When I feel down, I try to focus on the positives.	0.84
	I can lift my mood by redirecting my thoughts to positive ideas.	0.86
	I am able to think about the alternatives to a problem under stressful situations.	0.58
Empathy	I am aware of others' hardships.	0.65
	I feel bad when my friends are put down.	0.66
	I feel bad for my friends who are afraid or nervous about graduating.	0.42
Self-Control	I think about potential consequences before I act.	0.83
	I can wait for what I want.	0.50
	I think before I act.	0.85
Gratitude	I appreciate the relationships I have developed throughout my life.	0.76
	I appreciate those who are close to me.	0.76
	When I reflect on my life, there is much to be grateful for.	0.67
Zest	My friends describe me as full of life.	0.73
	I approach life with excitement and energy.	0.88
	I feel energetic in my life right now.	0.78
Optimism	I am able to stay positive even when facing uncertain situations.	0.76
	Each day I look forward to having a lot of fun.	0.77
	I usually expect to have a good day.	0.77

Note. All loadings were statistically significant at $p < .05$. For Spanish language items, contact Jose Antonio Piqueras Rodriguez, jpiqueras@umh.es

Analyses 3: Two-Level Model (12=>36)

Factor Structure. Exploring a model in which measurement invariance could be established across each of the three samples, analyses proceeded by testing a two-level model. Using the full sample from all three countries, a confirmatory factor analysis (CFA) was conducted to test the fit of the two-level (12=>36) structure using the 36 items and the first-level 12 factors (i.e., self-efficacy, persistence, self-awareness, family coherence, school support, peer support, emotional regulation, empathy, self-control, gratitude, zest, and optimism). Each item showed satisfactory factor loadings on the 12 factors. All parameter estimates were statistically significant ($p < .01$, Table 1). While the chi-square test results were significant, $\chi^2 = 7032.35$, $df = 528$, $p < .01$, all other fit indices were close to or within the recommended criteria, SRMR = .048, RMSEA = .040, 90% CI[.039, .041], CFI = .93. Thus, the two-level (12=>36) model adequately fit the data. Three CFAs were conducted separately to validate the identified factor structure in the Mexico, USA, and Spain samples, yielding good model-data fit. The fit statistics for all three samples were acceptable: Mexico, $\chi^2 = 4162.03$, $df = 528$, $p < .01$, SRMR = .047, RMSEA = .040, 90% CI[.039, .042], CFI = .926; USA, $\chi^2 = 1583.36$, $df = 528$, $p < .01$, SRMR = .042,

RMSEA = .035, 90% CI[.033, .037], CFI = .944; and Spain, χ^2 = 2374.37, *df* = 528, *p* < .01, SRMR = .055, RMSEA = .045, 90% CI[.043, .047], CFI = .914; Thus, the two-level model provided adequate fit statistics for use in interpreting the invariance tests.

Invariance Testing. With the full three-country sample, we tested measurement invariance in four steps. Model 1 (M1) tested the configural invariance across countries. Invariance at the configural level indicates that the free and fixed loadings pattern is supported in three countries. There was evidence for configural invariance using the chi-square statistic and subjective indexes of fit (M1, Table 2). Model 2 (M2) constrained all the first-order factor loadings to be equal across groups. Comparing the configural CFA model (Model 1) to Model 2 with metric invariance across groups using the chi-square statistic, there was a significant increase in model misfit, $\Delta\chi^2$ (48, *N* = 7579) = 203.97, *p* < .01. However, considering the chi-square test's sensitivity towards a large sample size, other fit indexes were also considered. When considering ΔCFI and ΔRMSEA, both showed a minimal shift in the model fit (Table 2), suggesting that constraining the factor loadings across Mexico, USA, and Spain does not significantly increase misfit; thus, metric invariance held. Model 3 was equivalent to Model 2, but the measurement intercepts were equal across groups with the additional constraints. Equality of the unstandardized item intercept (scalar invariance) was tested across groups and compared to the metric model. The scalar model fit well (see Table 2) according to fit indices except for the chi-square test results, $\Delta\chi^2$ (48, *N* = 7579) = 1492.31, *p* < .01. When comparing Steps 2 and 3, there was minimal change in CFI and RMSEA values, showing evidence for scalar invariance for these three groups.

With scalar invariance supported, the final step tested for residual invariance. Model 3 and 4 were identical, except for additional constraints, equaling item residuals across country groups. This model yielded a good fit to the data with minor changes in CFI and RMSEA. The results showed that the two-level (e.g., 12=>36) SEHS-HE model had evidence supporting measurement invariance for the Mexico, USA, and Spain samples.

Reliability and Concurrent Validity

Across the three samples, the college students, on average, expressed moderate to high covitality (Mexico: *M* = 5.02; USA: 4.63); Spain: *M* = 4.55). The reliability of the 12 subdomains showed consistency across the three samples with 23 of 30 Omega coefficients > .70. The persistence subdomain had marginal reliability coefficients, and the empathy subdomain reliability was inadequate. We also examined the association between the students' total SEHS-HE covitality index and the MHC-SF total score. The concurrent validity coefficients were positive and in the expected direction (Mexico = .55, USA = .64; Spain = .70).

Table 2. Goodness of Fit Statistics of Multiple Group CFA Models Evaluated

	χ^2	df	Models compared	$\Delta\chi^2$	Δdf	RMSEA (90% CI)	SRMR	CFI	ΔCFI	ΔRMSEA
Proposed Full Covitality Model 1=>4=>12=>36										
Overall sample (*N* = 7,579)	9578.17 (*p* < .01)	578	—	—	—	.045 (.045, .046)	.061	.903	—	—
Mexico (*n* = 4,207)	5282.35 (*p* < .01)	578	—	—	—	.044 (.043, .045)	.058	.904	—	—
USA (*n* = 1,638)	2555.72 (*p* < .01)	578	—	—	—	.046 (.044, .048)	.061	.894	—	—
Spain (*n* = 1,734)	3097.94 (*p* < .01)	578	—	—	—	.050 (.048, .052)	.071	.883	—	—
Exploratory 4=>12=>36 model										
Mexico (*n* = 4,207)	5263.44 (*p* < .01)	576	—	—	—	.044 (.043, .045)	.057	.904	—	—
USA (*n* = 1,638)	2512.07 (*p* < .01)	576	—	—	—	.045 (.043, .047)	.059	.897	—	—
Spain (*n* = 1,734)	3080.86 (*p* < .01)	576	—	—	—	.050 (.048, .052)	.070	.884	—	—
Exploratory 12=>36 model										
Mexico (*n* = 4,207)	4162.03 (*p* < .01)	528	—	—	—	.040 (.039, .042)	.047	.926	—	—
USA (*n* = 1,638)	1583.36 (*p* < .01)	528	—	—	—	.035 (.033, .037)	.042	.944	—	—
Spain (*n* = 1,734)	2374.37 (*p* < .01)	528	—	—	—	.045 (.043, .047)	.055	.914	—	—
Measurement invariance										
M1 Configural	8240.50 (*p* < .01)	1584	—	—	—	.041 (.040, .042)	.048	.927	—	—
M2 Metric	8444.47 (*p* < .01)	1632	2 v 1	203.97	48	.041 (.040, .042)	.051	.926	-.001	0
M3 Scalar	9936.78 (*p* < .01)	1680	3 v 2	1492.31	48	.044 (.043, .045)	.054	.910	-.016	.003
M4 Strict	10311.89 (*p* < .01)	1690	4 v 3	375.11	10	.045 (.044, .046)	.056	.906	-.004	.001

Discussion

The current study investigated the factor structure of the Spanish version of the SEHS-HE with Mexico, USA, and Spain college samples. Support for the 1=>4=>12=>36 factor model reported by Arslan et al. (2020) was partially replicated with the Mexico sample validating SEHS-HE to measure student-social-emotional competencies in higher education in Mexico. Further exploratory CFAs found measurement invariance for a two-level model (12 factors => 36 items) for Mexico, USA, and Spain. These 12 composite scores representing positive psychological traits (e.g., gratitude, persistence, emotional regulation) provide information about students' strengths that inform program planning for campus support services in these three cultural contexts. Also, since measurement invariance was established with Mexico, Spain, and USA college samples, it is possible to conduct additional analyses to explore latent means across groups, such as a latent profile analysis in future research.

The original SEHS-HE development involved 12 college student groups in a positive psychology undergraduate course. Each group was assigned one of the 12 subdomains (e.g., gratitude), examining relevant research, creating college-age-appropriate adaptations of the SEHS-Secondary items, and proposing new trial items. The only subdomain change was that the undergraduate students felt cognitive reappraisal better fit their experience than emotional regulation. The preliminary study SEHS-HE development study (Furlong et al., 2017) reported acceptable model fit, bit for a 1=>4=>12 model entering the 12 subscales as measured, not latent variables. Subsequently, Four CFAs evaluated the conceptually more compelling SEHS-HE 1=>4=>12=>36 covitality latent model with samples from the USA, Mexico, Spain, and Turkey (Arslan et al., 2020; the current study) with two of the four CFAs reporting acceptable fit indictors. The current study's nonoptimal findings provoke the need for additional research to clarify the adequacy of the 1=>4=>12=>36 second-order model as a conceptualized foundation for the SEHS-HE and the meaning of the covitality principle with college student populations.

Some SEHS-HE subscales performed less well than their SHE-Secondary counterparts, particularly persistence and empathy (empathy is also the SEHS-Secondary subscale with the lowest reliability), should be reexamined. Recognizing this need to refine, evaluate, and validate the SHE-HE measure, we are conducting cognitive interviews to re-assess their psychological meaning for college students exploring item modifications. Another consideration is to consider other subdomains that might provide a better match with college students' most crucial social and emotional experiences, such as self-compassion (Kroshus et al., 2021; Lathren et al., 2021) and forgiveness (Satici, 2020; Uyun et al., 2019). In articulating the covitality principle's ideas, we have emphasized that its subdomains exemplify positive mindset constructs—they do not encompass the universe of relevant constructs. The one caveat we have for other researchers is that when exploring alternate subdomains, the items should load on only one subdomain and not have the characteristics of a compound construct (OECD, 2021). For example, hope conceptually encompasses agency and pathway elements (Rand et al., 2020).

Another takeaway from the current study is the need to exercise conceptual openness and flexibility. The broader social and emotional learning field has emerged out of several research traditions, including (a) addressing the social skill development of students with special needs (e.g., Bierman & Greenberg, 2020), (b) promoting positive youth development (e.g., Lerner et al., 2021), and (c) implementing positive education initiatives (e.g., Kern & Wehmeyer, 2021), all of which could inform enhancements of the SEHS-HE content and suggest modifications of the covitality principle. OECD (2021) provides a comprehensive, well-developed, sophisticated model. As with most social and emotional frameworks and associated measures, this effort focuses on essential social-emotional behaviors, thoughts, and feelings of preadolescent (age 10) and adolescent (age 15) youths, with youth, teacher, and parent forms. The OECD conceptual frame builds on the Big 5 personality model assessing five primary domains that, like the SEHS-HE, include three subdomains: *Engaging Others* (sociability, assertiveness, energy), *Open-Mindedness* (tolerance, curiosity, creativity), *Collaboration* (empathy, trust, cooperation), *Emotional Regulation* (stress resistance, optimism, emotional control), *Task Performance* (self-control, responsibility, persistence). Although developed for school-age youth, the OECD cross-national project measure provokes deeper thinking about how best to conceptualize college students' essential social and emotional assets and assess them most efficiently. For example, with 120 items, the OECD is not optimal for most research and applied assessments in the college context.

Conclusion

In Mexico, the findings support SEHS-HE application and interpretation consistent with the hypothesized 1=>4=>12=>36 model. Although not an optimal result, the current study provided preliminary measurement invariance evidence for a first-order, two-level 12=>36 SEHS-HE factor structure for students from Mexico, the USA, and Spain, which supports considering students' profile of responses across all 12 subdomains. This finding also supports an essential aspect of the covitality principle. The covitality construct describes the synergistic benefits of multiple positive social and psychological assets. Covitality juxtaposes with comorbidity, the term for adverse multiplicative effects of co-occurring clinical diagnoses (Anastopoulos et al., 2018). The SEHS-HE covitality score's significant association with subjective well-being (MHC-SF) in all three samples provides a rationale for broad-spectrum campus services that foster student well-being based on the 12 SEHS-HE subdomains. We end by restating the value of practicing conceptual openness and

flexibility. The current study aimed to contribute to a more expansive effort to identify how to conceptualize and assess college students' social and experiences in support of programs that enhance their well-being and timely progress toward successful degree completion.

Limitations and Recommendations

The current study's modest findings should be interpreted considering several limitations. First, although the sample size is sufficiently large for the current study, data deviated significantly from normality, impeding measurement establishment at higher levels. Even though ML Estimation is considered robust for normality violations, future research should evaluate second-order measure invariance for multivariate normality. Given the yet inconsistent support of the SEHS-HE's hypothesized factor structure, researchers can contribute by evaluating its factor structure when used in future studies. Additional research should attempt to obtain higher-order invariance evidence to support the use of the scale in these countries. Finally, each country generated opportunity respondents from multiple institutions, but these samples do not represent each country's college-age population. For example, the USA Pacific Coast sample had one-fourth of students from an Asian ethnicity, which is not typical of USA college campuses.

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Conflict of Interest Statement

The authors declare that they have no conflict of interests related to the conduct of the investigation reported herein.

Authorship Contribution Statement

Furlong: Conceptualization, writing, editing/reviewing, supervision. Piqueras: Conceptualization, design, editing/reviewing, supervision. Gutiérrez: Conceptualization, design, analysis, editing/reviewing, supervision. Dowdy: Conceptualization, design, analysis, editing/reviewing, supervision. Nylund-Gibson: Conceptualization, design, analysis, editing/reviewing, supervision. Chan: Analysis, writing. Soto-Sanz: Conceptualization, design, editing/reviewing. Marzo: Conceptualization, design, editing/reviewing. Rodríguez-Jiménez: Conceptualization, design, editing/reviewing. Martínez-González: Conceptualization, design, editing/reviewing.

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