Extending Validation of a Social Emotional Health Measure For Middle School Students

Michael J. Furlong (mfurlong@ucsb.edu)
University of California Santa Barbara https://orcid.org/0000-0001-5011-4565

Jennica Paz
San Diego State University

Delwin Carter
University of California Santa Barbara

Erin Dowdy
University of California Santa Barbara

Karen Nylund-Gibson
Univrsity of California Santa Barbara

Research Article

Keywords: Social Emotional Healthy Survey, covitality, well-being, school mental health, middle school

Posted Date: November 8th, 2021

DOI: https://doi.org/10.21203/rs.3.rs-1051837/v1

Version of Record: A version of this preprint was published at Contemporary School Psychology on March 23rd, 2022. See the published version at https://doi.org/10.1007/s40688-022-00411-x.

Abstract

Heightened by the global Covid-19 pandemic, awareness of the need to monitor youths' social and emotional health increased. The Social Emotional Health Survey-Secondary-2020 (SEHS-S-2020) is a well-tested option for assessing student social emotional health and promoting mental health prevention, intervention, and multitiered systems of support efforts in schools. While a growing body of literature supports the SEHS-S-2020 measure for assessing student covitality, there is less validation evidence specifically for middle school-aged adolescents (Grades 6-8 in the U.S.). The present study aimed to fill this gap in the literature by examining its use for younger adolescents. Study participants included 9,426 students from 32 counties in California located across urban, suburban, and rural communities and 414 students in Grades 6-8 (ages 11-13 years) from two middle schools. Data analyses examined structural validity, internal consistency, measurement invariance, criterion validity, predictive validity, and response stability. Results indicate excellent fit indices for a four-level higher-order measurement model, with strong concurrent and one-year predictive validity coefficients, providing support for using the SEHS-S-2020 measure for use among young adolescents in middle school settings. The discussion focuses on implications for assessing students' psychosocial assets and universal school-based screening during this crucial developmental transition .

Introduction

The distressing effects of racial unrest, sociopolitical discord, natural disasters, and acts of violence reflect collective hardships experienced by citizens worldwide. These experiences have raised concern for youths' social-emotional functioning. In this social context, school systems must prioritize and attend to youths' evolving and complex mental health needs, fostering optimal academic and social-emotional functioning. National policy statements in the U.S. have called for systematic mental health and behavioral screening of school-aged youth (American Academy of Pediatrics, 2021a; Children's National, 2013). With increased awareness of the benefits of attending to youths' mental health needs and considering present-day circumstances, public policy and mental health experts emphasize the critical need to create pathways for equitable access to essential services (American Academy of Pediatrics, 2021b; National Alliance on Mental Illness, 2021; National Association of School Psychologists, 2021). These calls urge providers and policymakers to ensure the availability of high-quality, evidence-based mental health supports to help build upon youths' psychosocial strengths and mitigate traumatic experiences.

While the need for mental health services for students is peaking, the need-service gap continues to widen, especially for students of color, and from LGBTQIA+ backgrounds (Centers for Disease Control, 2021; National Association of School Psychologists, 2021). In a recent survey, Martinelli et al. (2020) reported overall decreasing youth well-being trends—72% of parents reported a decline in their child's well-being. Young adolescents, specifically those making the tumultuous transition from elementary to middle school levels, are in an exceptionally crucial life stage (Centers for Disease Control, 2021). When unaddressed, mental health challenges can significantly impede academic success and disrupt healthy developmental trajectories. However, with the onset of nearly half of mental health diagnoses by age 14 (i.e., ADHD, anxiety, and depression), only about 15% of adolescents (12-15 years of age) receive mental health supports within their school (National Alliance on Mental Illness, 2021).

Middle school students, especially after the onset of the COVID-19 pandemic, are navigating undiagnosed and untreated mental health struggles (National Association of Secondary School Principals, 2020). The physical,

neuro-architectural, and behavioral changes that transpire during early adolescence create opportunities for students to become active agents in shaping their path towards thriving trajectories (National Academies of Sciences, Engineering, 2019). With the increased awareness of the need to monitor youths' social and emotional health, especially among young adolescents in a vulnerable yet capable stage of life, it is crucial to recognize that schools are a natural ecosystem for these efforts to occur. Ideally, school-based mental health supports occur in the context of a caring community that includes culturally affirming mental health professionals implementing a purposeful and comprehensive mental wellness program. One aspect of an overall service model needs to include well-validated social-emotional measures to monitor student well-being.

Social Emotional Health Survey–Secondary (SEHS-S)

Furlong and colleagues (2014) posited that psychosocial strengths are related to a higher-order trait, covitality, contrasted with the mental health disorder comorbidity term. Covitality is "the synergistic effect of positive mental health resulting from the interplay among multiple positive psychological building blocks" (Furlong et al., 2014, p. 3). The covitality principle views psychosocial strengths as adaptive self-schemas linked with youth resilience and thriving developmental outcomes. These psychosocial strengths have the most impact when they co-occur in harmony rather than as isolation strengths (Furlong et al., 2020); *the whole is greater than the sum of its parts.* Considered from a transactional development lens, fostering balanced development of multiple core psychosocial strengths (e.g., gratitude, empathy, and persistence) promotes positive interpersonal transactions within a child's socio-ecological systems, contributing to optimal developmental outcomes (Furlong et al., 2020).

The covitality principle is operationalized with the 36-item Social Emotional Health Survey-Secondary (SEHS-S) measure that assesses 12 subscales assessing psychosocial strengths derived from the social emotional learning (SEL) and positive youth development (PYD) literature. The 12 subscales are associated with four correlated general positive social emotional health domains that assess the higher-order covitality latent construct. The first domain, belief-in-self, consists of three subscales grounded in constructs from self-determination theory literature: self-efficacy, self-awareness, and persistence. The second domain, belief-in-others, comprises three subscales derived from constructs found in childhood resilience literature: school support, peer support, and family support. The third domain, emotional competence, consists of three subscales based on constructs drawn from SEL scholarship: emotion regulation, empathy, and behavioral self-control. The final domain engaged living, comprises of three subscales grounded in constructs derived from the positive youth psychology literature: gratitude, zest, and optimism.

Since its development, 10 SEHS-S studies published in peer-reviewed journals have examined its reliability and validity (see Supplemental Material, Table 1 for SEHS validation studies). Three studies (Furlong, You, et al., 2014; You, Dowdy, et al., 2014; You, Furlong, et al., 2015) reported on its preliminary development with independent samples of California high school students. Confirmatory factor analyses supported a 1=≥ 4=> 12 measurement model with the 12 subscales treated as measured variables, loading on to four domains latent constructs (belief in self, belief in others, emotional competence, and engaged living) and one higher-order covitality latent construct. This model has been replicated with acceptable structural and concurrent validity fit statistics (SRMR, CFI, RMSEA) in six studies conducted in Japan (Iida et al., 2019; Ito et al., 2015), Korea (Lee et al., 2016), China (Pan et al., 2016), Lithuania (Ala et al., 2019), and Turkey (Telef & Furlong, 2017). Three of these studies included, but not exclusively, middle school-age students with older adolescents. In Spain, Piqueres et al. (2019) extended research by examining CFA fit statistics for the 1=> 4=> 12=> 36 model, which treated the 12 SEHS-S-2015 (see Furlong et al., 2018)

subscales as latent constructs. CFA analysis supported the hypothetical model's structural validity, acceptable reliability, and concurrent validity. Hinton et al. (2021) also reported an acceptable model fit for a Spanish language form completed by California students. Another study with an Iranian sample (Taheri et al., 2020) independently replicated the 1=> 4=> 12=> 36 model for the SEHS-S used as a self-report measure with older adolescents.

Recently Furlong and colleagues (2020) developed an updated SEHS-S-2020 edition which standardized a four-point response scale (1 = *not at all true*, 2 = *a little true*, 3 = *pretty much true*, and 4 = *very much true*) for all 36 items and made minimal wording changes to enhance readability. Drawing on the Piqueras et al. (2019) CFA analysis, two studies examined the structural validity of the 1=> 4=> 12=> 36 model for the SEHS-S-2020. Furlong, Dowdy, et al. (2021) found an acceptable fit with high internal consistency, one-year stability, and concurrent validity with life satisfaction and emotional distress measures.

Study Purpose

The body of psychometric research validating the SEHS-S as a self-report measure for older adolescents is growing. However, there is less validation specifically for middle school adolescents (Grades 6-8, ages 11-13 in the U.S.), and there is limited validation evidence for the SEHS-S-2020 edition with this age group. Critically, there is a need to validate the SEHS-S-2020 with middle school students because they are at a crucial development cusp with more diversity in physical and psychological development than in any other school context (Evans et al., 2018). Middle school campuses include pre- and post-pubescent youths and those with varying higher-order association reasoning and emotional self-control (Qualter et al., 2007). The middle school years also presents students with substantially increased demands for academic and social autonomy, and this age range is also when many anxiety disorders emerge (Kessler et al., 2005). The developmental experiences of middle school students are sufficiently unique that we cannot assume that the SEHS-S-2020 structural model sufficiently captures their still-forming social and emotional competencies. The present study aimed to fill this gap in the SEHS-S-2020 validation literature to support its use across school configurations that include younger adolescents.

Method

Procedures and Participants

We examined the SEHS-S-2020's psychometric characteristics drawing on subsets of data from the California Student Wellness Study (see www.covitalityucsb.info). The responses used in the current study have not been used in any previously published study.

Sample 1, Structural Validity

A randomly selected subsample of students who completed the California Healthy Kids Survey (CHKS) between October 2017 and June 2019 was used to examine structural validity. The CHKS is an anonymous comprehensive school-based surveillance survey used in California for more than 20 years, administered by WestEd for the California Department of Education. Parents provided permission, and students provided assent. A school-site administrator coordinated the CHKS online survey (see https://calschls.org/survey-administration/). Students completed the core CHKS module in Grades 7, 9, and 11. In some instances, schools opted to administer the survey to all students. The responses of middle school students in Grade 7 (27,786) and 8 (4,713) were compiled for the

current study. The random sampling of 4,713 eighth graders equated the sample for analysis. The total sample size was 9,426 from 32 of California's 58 counties across urban, suburban, and rural communities. The characteristics of the data subsets used for calibration, validation, and invariance structural validity analyses are available in Supplemental Material, Table 2.

Sample 2, Concurrent and Predictive Validity, and Stability Analysis

Following university human subjects committee approval, passive parental consent, and student assent, an online survey was administered at two California middle schools (ages 11-13 years) as part of their effort to monitor middle school students' well-being. Teachers received a script with which to proctor administration. Students completed the online survey in October 2017 (Year 1) and 2018 (Year 2). The SEHS-S-2020 items were presented in a different random order to each student at each administration. The students entered their unique school identifier each year, allowing examination of one-year response stability for 414 students. In Year 1, the students were in Grades 6 (31.4%), Grade 7 (31.6%), and Grade 8 (37.0%). The students' preferred gender identification was female (51.9%), male (47.3%), and declined to state (0.7%). For ethnicity, most students identified as White (53.1%), two or more ethnicities (18.4%), Hispanic/Latinx (17.9%), and other ethnicities (10.3%). English (75.1%) was the home language for most students, followed by Spanish (15.0%) and another language (9.9%).

Measures

Both samples completed the SEHS-S-2020. Sample 2 completed the Brief Multidimensional Student Life Satisfaction Scale, Social Emotional Distress Scale, and the Positive and Negative Affect Scale for Children.

Social Emotional Health Survey-Secondary-2020

The SEHS-S-2020 had 36 items as described earlier in this manuscript (items shown in Supplemental Material Table 4).

The Brief Multidimensional Student Life Satisfaction Sale (BMSLSS)

This widely used measure assesses student life satisfaction across friends, family, self, school, and living environment domains. The response options are: 1 = *strongly dissatisfied* … 6 = *strongly satisfied* (Athay et al., 2012; Bickman et al., 2010). Acceptable internal consistency is reported for previous samples (a = .75–.81; Huebner 1991; Huebner et al., 2006).

Social Emotional Distress Scale (SEDS)

The 10 SEDS items assess adolescents' recent (past month) emotional distress using a four-point response scale: 1 = *not at all true*, 2 = *a little true*, 3 = *pretty much true*, 4 = *very much true*. A sample item is, *I had a hard time breathing because I was anxious*. CFA supports a unidimensional model with robust reliability a = .94 and w = .95 (Dowdy et al., 2018).

Positive and Negative Affect Scale for Children (PANAS-C)

The PANAS-C (Ebesutani et al., 2012) assesses the frequency of past-week emotional experiences: 0 = *not at all*, 1 = *a little*, 2 = *moderately*, 3 = *quite a bit*, and 4 = *extremely*. The PANAS-C Positive Affect (PANAS-Pos; joyful, delighted, cheerful, alert, determined) and the PANAS-C Negative Affect (PANAS-Neg; scared, gloomy, nervous, upset, sad) have demonstrated adequate reported alpha reliability coefficients of .76 and .85, respectively.

Analysis Plan And Results

Sample 1: Analysis Plan and Results

Conformatory Factor Analysis (CFA)

CFA with the SEHS-S-2020 evaluated support for its hypothesized 1=> 4=> 12=> 36 higher-order model. Model fit was assessed using recommendations from the literature: comparative fit index (CFI > .95), root mean square of approximation (RMSEA < .05) and standardized root mean square residual (SRMR < .05) indicated excellent model fit (Browne & Cudeck, 1989, Hu & Bentler, 1999). Using MPlus 8 version 8.4 (Muthén & Muthén, 1998-2019) calibration/validation (CV) was conducted on a random subsample of 1000 students (500 seventh graders and 500 eighth graders) drawn from the 9,426 sample 1 students (described above) for the full 1=> 4=> 12=> 36 covitality model (Cudeck & Browne, 1983). The use of cross-validation is important when selecting a reliable model that is expected to fit data from other samples (Whittaker & Stapleton, 2006; MacCallum et al., 1992). A CFA was conducted on a random subsample of 1,000. A second random subsample of 1,000 cases (500 seventh graders and 500 eighth graders), drawn without replacement, replicated model fit for the full 1=> 4=> 12=> 36 covitality model. Next, model parameters from the full covitality model in the first subsample CFA were used to rerun the model for the second subsample. Information criteria (i.e., AIC, BIC, SABIC) were then inspected to evaluate differences between the calibration and validation model. Lower information criteria values indicate robust replicability.

The CFA for the SEHS-S-2020 1=> 4=> 12=> 36 hypothesized higher-order factor structure had excellent model fit, c2(578) = 10038.69, *p* < .001, CFI = .959, RMSEA = .042 [CI = .041, .042], and SRMR = .042. The calibration and validation results indicated an almost identical model fit and lower information criteria values, providing evidence that the full covitality model was successfully replicated with a different subsample (see Table 1).

Internal Consistency Analysis Plan and Results

SEHS-S-2020 Cronbach's alpha (a) and Omega (W) coefficients were evaluated for its 12 subdomains, 4 domains, and the overall covitality index. Values higher than .80 provide evidence that the items are measuring the same construct (Cronbach, 1951, McDonald, 1999). The SEHS-S-2020 covitality total score internal consistency was excellent (a = .96, W = .95). The four SEHS-S-2020 domains showed excellent reliability (belief in self a = .88, W = .87; belief in others a = .87, W = .85; emotional competence a = .87, W = .87; engaged living a = .94, W =.93), and the 12 subscale coefficients indicated moderate to strong reliability (a range = .70–.95, W range = .70–.95, see Supplemental Material, Table 3 for all reliability coefficients).

Measurement Invariance (MI) Analysis Plan and Results

To evaluate SEHS-S-2020 score invariance across a range of demographic subgroups, multigroup CFA examined MI for (a) gender, (b) grade level, (c) Hispanic/Latinx status, and (d) ethnicity identification. This analysis used Mplus version 8.4 (Muthén & Muthén, 1998-2009) with maximum likelihood (ML) and unit variance identification. Using random subsamples of n = 1000 from the structural validity sample 1, CFAs analyzed model fit for subgroups. Subsequently, successive multigroup CFAs were employed to evaluate configural, metric, and scalar invariance (Vandenberg & Lance, 2000). MI provides evidence that the factor structure, loadings, and intercepts are similar across subgroups. Invariance tests, conducted sequentially, first examined the model with all parameters freely estimated across groups (configural invariance). Determining configural invariance establishes that the model's structure fits the data well for each compared group. Next, metric invariance was tested by holding the loadings equal across groups. When compared to the configured models, metric invariance is established when ΔCFI < .01 and ΔRMSEA < .015 (or ΔSRMR < .03; Chen, 2007). Scalar invariance analysis held the loadings and intercepts equal across groups. The establishment of scalar invariance indicates that participants' scores on the latent construct and observed variable will be the same regardless of their group membership. Scalar invariance is confirmed when the comparison to the metric model yields a ΔCFI < .01 and ΔRMSEA < .015 (or ΔSRMR < .01) (Chen, 2007). Scalar invariance, when found, allows researchers to make inferences via extrapolation claims for each of the subgroups.

Initial CFAs for each group and subgroup indicated an excellent fit. Tests for MI indicated that all three levels of the model were invariant across: (a) grade level (i.e., Grades 7 and 8, see Table 2); (a) gender (i.e., male v. female binary identity, see Table 3); and (c) Hispanic/Latinx identification (i.e., Hispanic/Latinx v. non-Hispanic/Latinx, see Table 4). The ΔCFI was less than .01, ΔRMSEA < .015, and ΔSRMR < .01 for all comparisons for all groups. Results indicated that the SEHS-S-2020 items measure the covitality construct in similar ways across relevant demographic identifications, supporting future extrapolation and scoring claims.

Sample 2: Analysis Plan and Results

Stability

An ANOVA, using SPSS V27, compared the mean SEHS-S-2020 total covitality scores for Grades 6, 7, and 8. The means were negatively skewed (above 3 on the 4-point response format). Post-hoc comparisons show that in Year 1, the sixth-graders' mean was significantly higher than the eight-graders, however, with a negligible effect size (h^2 = .021). The Year 2 means had no significant differences. The internal consistency of the covitality total score for Years 1 and 2 was a = .94, with one-year test-retest coefficient of r = .66.

Criterion and Predictive Validity

Bivariate correlations examined association of the total covitality score with concurrent and one-year predictive measures. All *concurrent* (BMSLSS, r = .65; PANAS-Pos, r = .59; SEDS, r = -.46; PANAS-Neg, r = -.38) and *one-year* predictive validity coefficients (BMSLSS, r = .52; PANAS-Pos, r = .43; SEDS, r = -.27; PANAS-Neg, r = -.27) were significant (p < .001) in the expected directions. The concurrent validity coefficients had adequate (PANAS-Neg) or

considerable correspondence (BMSLSS, PANAS-Pos, SEDS) with adequate one-year prediction for the BMSLSS and PANAS-Pos wellness indicators (Shepherd et al., 2015).

Discussion

Given the increased awareness of the need to focus on student social and emotional health, it is critical to have a measure that supports efforts to assess mental health and wellness in schools. Consistent with previous SEHS-S-2020 research among older adolescents, this study provides psychometric evidence supporting its use with early adolescents. Considering the critical developmental changes experienced by middle school students and the continued emphasis on early identification and prevention, practitioners and researchers now have a tool to guide mental wellness efforts in younger adolescents.

This study indicates that the full 1=> 4=> 12=> 36 covitality model was supported for this sample of middle school students. As such, in addition to providing the overall covitality index, the four domains, and the 12 subscales can be examined and used. This important finding indicates that it is possible to analyze, for each student or a schoolwide prevention effort, the 12 psychological building blocks and four higher-order domains that have robust evidence of being linked to positive youth development. For example, following the administration of the SEHS-S-2020, a practitioner should feel confident in their ability to assess a student's level of peer support, emotional regulation, gratitude, and each of the 12 latent traits. In alignment with best-practice intervention principles, preventative techniques may be helpful to boost any of the 12 latent traits (Lenzi, Dowdy et al., 2015; Lenzi, Furlong, et al., 2015).

The invariance findings indicate that the covitality construct is measured similarly across important gender identity and ethnicity demographic identifications. This finding is critical for schoolwide efforts when assessing students from diverse backgrounds together. Additionally, stability findings for this sample of middle school students are like findings of older adolescents (Furlong, Nylund-Gibson, et al., 2020) and suggest that psychological strengths form early and are generally stable. These findings underscore the need for early efforts to help students develop positive internal and external working models. The importance of monitoring covitality and constructs assessed on the SEHS-S-2020 is also essential considering their relations to significant life outcomes, including increased life satisfaction and positive affect, and decreased negative affect and social-emotional distress.

Covitality Principle Perspectives

The covitality principle measured by the SEHS-S-2020 is well established and has broad applications across national student samples, including younger and older adolescents. Nonetheless, as researchers reflect on the methodological limitations of every study, it is essential to underscore the conceptual and practical limitations of any psychological assessment. Subsequently, we consider the need for continued research to evaluate the contexts for applying the covitality principle meaningfully. Notably, three central perspectives researchers and practitioners should evaluate when using the SEHS-S-2020 are reviewed.

Consideration 1: Are SEHS-S Constructs Optimal?

Are the SEHS-S-2020 constructs optimally valid and informative across sociocultural contexts? As operationalized with the SEHS-S, the covitality principle includes latent constructs linked to core developmental task domains.

These constructs draw upon theoretical perspectives from social psychology, self-determination theory, developmental assets literature, social-emotional learning literature, and the positive psychology literature. The four domains pertain to the life-long coalescence of a person's sense of self, social belonging, emotional management, and positive character traits. When using the SEHS-S-2020, it is crucial to recognize that it was never intended that its 12 subscales and four domains include all possible covitality principle constructs. Other constructs could provide meaningful options in specific sociocultural contexts. For example, gratitude is in the engaged living component of the SEHS-S-2020. Emmons et al.'s (2019) definition of gratitude includes a moral component that presumably increases a Western culture person's motivation to reciprocate but falls short of a repaid social debt. The three blessings gratitude exercise shows that gratitude is boosted merely by reflecting daily on benefits received from others without planning or engaging in reciprocal actions. In some cultural contexts, such as Korea and China (Mendonça et al., 2018), gratitude has nuanced interpretations. In these cultural contexts, reflecting on benefits received from others without considering reciprocity could produce guilt feelings for accepting benefits and not giving in return.

Another consideration is that various social, emotional, and social-cultural experiences can be associated with other meaningful constructs that fit the covitality principle. In China, the concept of psychological suzhi (Qian et al., 2020) has similarities with the covitality principle but has a deeper meaning within Chinese cultures. In a similar vein, Hispanic/Latinx cultures might prioritize evaluating different assets such as academic persistence and *familismo* (Hernandez et al., 2021). In Hawai'i, the statewide SEL framework has an important focus on indigenous Hawaiian values, language, culture, and history, and students' sense of belonging and responsibility to the *Āina* (land) of Hawai'i as a valued, sacred "place" (Hawai'i State Department of Education, n.d., 2019). Predating Seligman's positive psychology initiative (Seligman & Csikszentmihalyi, 2000), Black American psychologist Joe White (1984) identified seven psychological strengths uniquely shaped by African Americans' experiences of slavery and racism: improvisation, resilience, connectedness to others, spirituality, emotional vitality, gallows of humor, and a "healthy suspicion of you know who" (White, 1984). White described emotional vitality as having excitement, a high level of energy, zest for life—behaving in a manner that approaches life enthusiastically. White's conceptualization aligns closely with the SEHS-S-2020 zest subscale, yet we caution that its three items do not adequately capture the nuanced expression that White intended. Finally, with only three items per subscale, the SEHS-S-2020 subscales are inadequate when researcher and intervention interests focus deeply, for instance, on student optimism, persistence, and self-regulation.

Consideration 2: Covitality Principle Limitations

As a growing body of research identifies various development benefits associated with high covitality (Lenzi, Furlong et al., 2015; Lenzi, Dougherty et al., 2015), we caution that more research is needed to examine various developmental outcomes among vulnerable student groups. As an example, sexual minoritized youth report substantially higher suicide ideation than their cisgender peers, particularly when they experience gender-related, bias-related victimization (Turban et al., 2021). Conversely, other research indicates transgender youth experience positive mental health when their gender identity is supported and validated within their social spheres (Olson et al., 2016), highlighting social support as a protective factor. Examining this dynamic, O'Malley et al. (2021) evaluated the SEHS-S-2020 constructs' resilience-enhancing potential for students who experienced minoritized gender and sexual bullying victimization. For students identifying as transgender and experiencing minority-related bullying and victimization, O'Malley et al. (2021) found that covitality strengths, as measured by the SEHS-S-2020, did not protect against suicide ideation or chronic sadness. That is, evidence for the covitality principle effect was not

found. Although the O'Malley et al. and other studies have found promotive and protective developmental covitality effects, it does not follow that this is necessarily the case for all students, particularly those who have life experiences subject to historical othering and oppression. For some students, the intensity of exposure to trauma and identity-related victimization could be so pervasive and upsetting that, as measured by the SEHS-S-2020, covitality's resilience advantage is overwhelmed. The importance of this consideration is that well-intentioned school-based services focusing on efforts to foster individual student assets, metaphorically activating the covitality principle, may fall short. Instead, we advocate for a balanced perspective that recognizes a parallel effort to create safe and affirming social environments for all students to reduce exposure to warfare, trauma, racism, harassment, and other forms of oppression that could overwhelm their assets' resilience capacity (Edwards, 2021).

Consideration 3: To What End Covitality?

The SEHS-S-2020 covitality elements are associated with overall personal development, with several studies showing positive associations with global subjective well-being. High subjective well-being is only one outcome indicator; future research must explore the broader purpose of fostering covitality strengths. The covitality principle, as measured by the SEHS-S-2020, signifies that a student has a comprehensive set of social and psychological assets; however, it does not provide information about how the student uses those assets. The links between the covitality principle and youths' broader purposes, dreams, and aspirations are yet unexamined sufficiently. What values do they hold? How do they see themselves as global citizens? How do they contribute meaningfully to their micro and macro communities (Mercier et al., 2019) via the arts, activism, public service, or community building?

Study Qualifications And Conclusion

A primary qualification of this study's findings is that although the sample size was large and drawn from urban, suburban, and rural communities, it is not representative of the wider USA middle school student population. Additionally, in the California public education context, students who identify as Latinx comprise a plurality of students, as noted in the Participants description section of the manuscript. Hence, establishing measurement invariance for Latinx-identifying students is a prerequisite for use in the California school context, a substantial world geographic and population center. As apparent in the history of slavery and racism in the U.S., questions about race and ethnic-cultural identification are fraught with social over-tones. California has one of the most diverse populations worldwide, having drawn citizens from Europe, Central America, and the Pacific Rim for more than 150 years. Hence, the statewide school survey providing the current study's data set asks three questions about race. The "race" question uses categories employed by the U.S. national census: American Indian/Alaskan Native, Asian, Black, White, Native Hawaiian/ Pacific Islander. Students can select one or more "racial" groups. Almost one-half (47.2% in the invariance sample) of the students reported identifying with two or more "racial" groups, attesting to the unique diversity of California's student population.

Given this sample demographic characteristic and size, the proportion of students in other important groups, such as those identifying a Black, was small. Furthermore, the use of the historical "racial" terms is reductionist. For example, the California statewide survey asks students who identify as racially "Asian" for more specific information with the following groups represented: Asian Indian, Cambodian, Chinese, Filipino, Hmong, Japanese, Korean, Laotian, Vietnamese, and other Asian. Hence, efforts to examine appropriate use for all these groups would require a large dataset and are much needed.

We further note the complexity of using “race” to indicate students’ relevant social contexts when intersectionality is prominent in diverse social contexts like California. Notably, in other California statewide surveys, 65% of students who identified with two or more “racial” groups also identified as Hispanic, yet 25% of students who identified as White also identified as Hispanic. Even 11% of American Indian students identified as Hispanic. Intersectionality matters related to “race” and ethnicity are the norm in the highly diverse California social context. We acknowledge these limitations and recognize the need for future research to evaluate the SEHS-S-2020 structural validity for all groups.

Since this study employed mono-method procedures (i.e., self-report), future studies should investigate multi-informant assessments (parent and teacher forms; e.g., Branscum, 2020) based on the covitality framework. Another limitation is that some types of validation were unexamined. It is essential to evaluate how students’ responses to the SEHS-S-2020 are associated with their daily school experiences. Research examining other measurement methods (e.g., experience sample monitoring) is needed to investigate the association between students’ real-time emotions with characteristics measured by the SEHS-S-2020 characteristics.

The SEHS-S-2020 is available for use as part of comprehensive school-wide efforts to respond to the need for students’ mental and behavioral health services. Structural validity, internal consistency, measurement invariance, criterion validity, predictive validity, and response stability estimates all support its use among young adolescents in middle schools. The SEHS-S-2020 can be helpful to assess students’ psychosocial assets as part of school-based screening efforts to support students’ well-being.

Declarations

Competing Interests

The authors have no competing interests to declare that are relevant to the content of this article.

Funding Source

The research reported here was supported in part by the Institute of Education Sciences, U.S. Department of Education, through Grant # R305A160157 to the University of California, Santa Barbara. The opinions expressed are those of the authors and do not represent views of the Institute of Education Sciences or the U.S. Department of Education.

Ethics Review and Approval

The study methods and informed consent procedures employed in this study were approved the University of California Santa Barbara Human Subjects Committee, Protocol Number 10-19-0151.

Data Set Availability

The datasets analyzed for the current study and associated Mplus commands are available from the corresponding author on request. They are also available in the Dryad Data Repository.

References

Ala, P., Virginija, G., & Vaiva, R. (2019). Adolescent social emotional health, empathy, and self-esteem: Preliminary Validation of the Lithuanian version of the SEHS-S questionnaire. *Psychology in Russia: State of the Art, 12*(4). http://psychologyinrussia.com/volumes/?article=8316

American Academy of Pediatrics. (2021a). *Mental and behavioral health in children: A crisis made worse by the pandemic*. https://services.aap.org/en/news-room/news-releases/aap/2021/mental-and-behavorial-health-in-children-a-crisis-made-worse-by-the-pandemic/

American Academy of Pediatrics. (2021b). *Promoting children's mental health.* https://services.aap.org/en/patient-care/mental-health-initiatives/

Athay, M. M., Kelley, S. D., & Dew-Reeves, S. E. (2012). Brief Multidimensional Students' Life Satisfaction Scale–PTPB version (BMSLSS-PTPB): Psychometric properties and relationship with mental health symptom severity over time. *Administration and Policy in Mental Health*, *39*(1–2), 30. https://dx.doi.org/10.1007%2Fs10488-011-0385-5`

Bickman, L., Athay, M. M., Riemer, M., Lambert, E. W., Kelley, S. D., Breda, C., Tempesti, T., Dew-Reeves, S. E., Brannan, A. M., & Vides de Andrade, A. R. (Eds.). (2010). *Manual of the Peabody Treatment Progress Battery, 2nd ed.* [Electronic version]. Vanderbilt University. http://peabody.vanderbilt.edu/ptpb\

Branscum, A. M. (2020). *Strength-based assessment of adolescents: A multi-informant approach.* University of Central Arkansas, Doctoral dissertation. https://www.proquest.com/openview/af00030eb58ecdc4831ceb5ff279a761/1.pdf?pq-origsite=gscholar&cbl=18750&diss=y

Browne, M. W., & Cudeck, R. (1989). Single sample cross-validation indices for covariance structures. *Multivariate Behavioral Research, 24*(4), 445–455. https://doi.org/10.1207/s15327906mbr2404_4

Centers for Disease Control. (2021). *Youth Risk Behavior Survey data summary and trends report 2009-2019.* https://www.cdc.gov/healthyyouth/data/yrbs/pdf/YRBSDataSummaryTrendsReport2019-508.pdf

Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling, 14,* 464–504. https://doi.org/10.1080/10705510701301834

Children's National. (2013). *Children's National calls for improved pediatric mental health treatment.* www.childrensnational.org/pressroom/NewsReleases/childrens-national-calls-for-improved-pediatric-mental-health-treatment.aspx

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*(3), 297–334. https://doi.org/10.1007/BF02310555

Cudeck, R., & Browne, M. W. (1983). Cross-validation of covariance structures. *Multivariate Behavioral Research, 18*, 147–167. https://doi.org/10.1207/s15327906mbr1802_2

Dowdy, E., Furlong, M. J., Nylund-Gibson, K., Moore, S., & Moffa, K. (2018). Initial validation of the Social Emotional Distress Scale to support complete mental health screening. *Assessment for Effective Intervention, 43*, 241–248. https://doi.org/10.1177%2F1534508417749871

Ebesutani, C., Regan, J., Smith, A., Reise, S., Higa-McMillan, C., Chorpita, B. F. (2012). The 10-item positive and negative affect schedule for children, child and parent shortened versions: Application of item response theory for more efficient assessment. *Journal of Psychopathology and Behavioral Assessment, 34*(2), 191–203. https://doi.org/10.1007/s10862-011-9273-2

Edwards, E. (2021). Centering race to move towards an intersectional ecological framework for defining school safety for Black students. *School Psychology Review, 50*(2-3), 254–273. https://doi.org/10.1080/2372966X.2021.1930580

Emmons, R. A., Froh, J., & Rose, R. (2019). Gratitude. In M. W. Gallagher & S. J. Lopez (Eds.), *Positive psychological assessment: A handbook of models and measures* (pp. 317–332). American Psychological Association. https://doi.org/10.1037/0000138-020

Evans, D., Borriello, G. A., Field, A. P. (2018). A review of the academic and psychological impact of the transition to secondary education. *Frontiers in Psychology, 9,* 1482. https://doi.org/10.3389/fpsyg.2018.01482

Furlong, M. J., Dowdy, E., & Nylund-Gibson, K. (2018). Social Emotional Health Survey-Secondary: 2015 edition. ERIC. https://files.eric.ed.gov/fulltext/ED600144.pdf

Furlong, M. J., Dowdy, E., Nylund-Gibson, K., Wagle, R., Carter, D. & Hinton, T. (2021). Enhancement and standardization of a universal social-emotional health measure for students' psychological strengths. *Journal of Well-Being Assessment*. https://doi.org/10.1007/s41543-020-00032-2

Furlong, M. J., Nylund-Gibson, K., Dowdy, E., Wagle, R., Hinton, T., & Carter, D. (2020). *Modification and standardization of Social Emotional Health Survey-Secondary— 2020 edition.* ERIC. 2020. https://files.eric.ed.gov/fulltext/ED600109.pdf

Furlong, M. J., O'Brennan, L. M., & You, S. (2011). Psychometric properties of the Add Health School Connectedness Scale for 18 sociocultural groups. *Psychology in the Schools, 48,* 986–997. http://dx.doi.org/10.1002/pits.20609

Furlong, M. J., You, S., Renshaw, T. L., Smith, D. C., & O'Malley, M. D. (2014). Preliminary development and validation of the Social and Emotional Health Survey for secondary students. *Social Indicators Research, 117,* 1011–1032. https://doi.org/10.1007/s11205-013-0373-0

Hawai'i State Department of Education. (2019). *2030 promise plan: Action opportunities to realize five promises to students.* https://eric.ed.gov/?q=source%3A%22Hawaii+State+Department+of+Education%22&id=ED600666

Hawai'i State Department of Education. (n.d.). *Nā Hopena A'o (HĀ): HĀ: Breath.* Website. https://www.hawaiipublicschools.org/TeachingAndLearning/StudentLearning/HawaiianEducation/Pages/HA.aspx

Hernandez, I. A., Silverman, D. M., & Destin, M. (2021). From deficit to benefit: Highlighting lower-SES students' background-specific strengths reinforces their academic persistence. *Journal of Experimental Social Psychology, 92,* 104080. https://doi.org/10.1016/j.jesp.2020.104080

Hinton, T., Dowdy, E., Nylund-Gibson, K., Furlong, M. J., & Carter, D. (2021). Examining the Social Emotional Health Survey-Secondary for use with Latinx youth. *Journal of Psychoeducational Assessment, 39,* 242–246. https://doi.org/10.1177/0734282920953236

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6,* 1–55. https://doi.org/10.1080/10705519909540118

Huebner, E. S. (1991). Further validation of the students' life satisfaction scale: The independence of satisfaction and affect ratings. *Journal of Psychoeducational Assessment, 9*, 363–368. https://doi.org/10.1177%2F073428299100900408

Huebner, E. S., Seligson, J. L., Valois, R. F., & Suldo, S. M. (2006). A review of the brief Multidimensional Students' Life Satisfaction Scale. *Social Indicators Research, 79*(3), 477–484. https://www.jstor.org/stable/27522650

Iida, J., Ito, A., Aoyama, I., Sugimoto, K., Endo, H., & Furlong, M. J. (2019). Development of Japanese version of Social Emotional Health Survey. *The Japanese Journal of Psychology, 90,* 32–41. https://doi.org/10.4992/jjpsy.90.17222

Ito, A., Smith, D. C., You, S., Shimoda, Y., & Furlong, M. J. (2015). Validation of the Social Emotional Health Survey–Secondary for Japanese students. *Contemporary School Psychology, 19,* 243–252. http://link.springer.com/article/10.1007/s40688-015-0068-4

Kessler, R. C., Adler, L. A., Barkley, R., Biederman, J., Conners, C. K., Faraone, S. V., Laurence L., Greenhill, L. L., Jaeger, J., Secnik, K., Spencer, T., Üstün, T. B., & Zaslavsky, A. M. (2005). Patterns and predictors of attention-deficit/hyperactivity disorder persistence into adulthood: Results from the national comorbidity survey replication. *Biological Psychiatry, 57*(11), 1442–1451. https://doi.org/10.1016/j.biopsych.2005.04.001

Lee, S., You, S., & Furlong, M. J. (2016). Validation of the Social Emotional Health Survey for Korean school students. *Child Indicators Research, 9,* 73–92. https://doi.org/10.1007/s12187-014-9294-y

Lenzi, M., Dougherty, D., Furlong, M. J., Dowdy, E., & Sharkey, J. D. (2015). The configuration protective model: Factors associated with adolescent behavioral and emotional problems. *Journal of Applied Developmental Psychology, 38*, 49–59. https://doi.org/10.1016/j.appdev.2015.03.003

Lenzi, M., Furlong, M. J., Dowdy, E., Sharkey, J. D., Gini, G., & Altoè, G. (2015). The quantity and variety across domains of psychological and social assets associated with school victimization. *Psychology of Violence, 5,* 411–421. https://psycnet.apa.org/doi/10.1037/a0039696

MacCallum, R. C., Roznowski, M., & Necowitz, L. B. (1992). Model modifications in covariance structure analysis: The problem of capitalization on chance. *Psychological Bulletin, 111*(3), 490–504. https://doi.org/10.1037/0033-2909.111.3.490

Martinelli, K., Cohen, Y., Kimball, H., & Sheldon-Dean, H. (2020). *Children's Mental Health Report: Telehealth in an increasingly virtual world. Child Mind Institute.* https://childmind.org/our-impact/childrens-mental-health-report/2020-childrens-mental-health-report/

McDonald, R. P. (1999). *Test theory: A unified treatment.* Erlbaum. https://doi.org/10.4324/9781410601087

Mendonça, S. E., Merçon-Vargas, E. A., Payir, A., & Tudge, J. R. (2018). The development of gratitude in seven societies: Cross-cultural highlights. *Cross-Cultural Research, 52*(1), 135–150. https://doi.org/10.1177%2F1069397117737245

Mercier, J., Powell, C., Langdon-Pole, G., Finau, F., Hicks, K., Bourchier, L., & Hampton, J. (2019). The five Cs of positive youth development in an Aotearoa/New Zealand program context. *Journal of Youth Development, 14,* 36–58. https://jyd.pitt.edu/ojs/jyd/article/view/19-14-04-FA-2

Muthén, L. K., & Muthén, B. O. (1998-2019). *Mplus user's guide (8th ed.).* Muthén & Muthén.

National Academies of Sciences, Engineering, and Medicine. (2019). Adolescent development. In R. J. Bonnie & E. P. Backes (Eds.), *The promise of adolescence: Realizing opportunity for all youth* (pp. 37–75). The National Academies Press. https://doi.org/10.17226/25388

National Alliance on Mental Illness. (2021). *Mental health in schools: NAMI public policy position*. https://www.nami.org/NAMI/media/NAMI-Media/Public%20Policy/Mental-Health-In-Schools_final.pdf

National Association of School Psychologists. (2021). *Comprehensive school-based mental and behavioral health services and school psychologists.* https://www.nasponline.org/resources-and-publications/resources-and-podcasts/mental-health/school-psychology-and-mental-health/comprehensive-school-based-mental-and-behavioral-health-services-and-school-psychologists

National Association of Secondary School Principals. (2020). *Position statement: Mental health in middle level and high schools.* https://www.nassp.org/mental-health-in-middle-level-and-high-schools/

O'Malley, M., Cerna, R., Romero, L., Zhang, G., & Furlong, M. J. (2021). *Bias-based bullying and suicidal thoughts among sexual and gender minority youth: Are psychological strengths enough?* Manuscript under review.

Olson, K. R., Durwood, L., DeMeules, M., & McLaughlin, K. A. (2016). Mental health of transgender children who are supported in their identities. *Pediatrics, 137*(3). http://pediatrics.aappublications.org/content/early/2016/02/24/peds.2015-3223

Pan, Y-G., Zhang, D-J., Chen, W-F., & Liu G-Z. (2016). Preliminary validation of the Social and Emotional Health Survey in Chinese secondary school students. *Chinese Journal of Clinical Psychology, 24,* 680–683. http://dx.doi.org/10.16128/j.cnki.1005-3611.2016.04.024

Piqueras, J. A., Rodriguez-Jimenez, T., Marzo, J. C., Rivera-Riquelme, M., Martinez-Gonzalez, A. E., Falco, R., & Furlong, M. J. (2019). Social Emotional Health Survey-Secondary (SEHS-S): A universal screening measure of Social-Emotional strengths for Spanish-speaking adolescents. *International Journal of Environment Research Public Health, 16,* 4982. https://doi.org/10.3390/ijerph16244982

Qian, N., Yang, C., Teng, Z., Furlong, M. J., Pan, Y., Guo, C., & Zhang, D. (2020). Psychological Suzhi mediates the longitudinal association between perceived school climate and depressive symptoms. *School Psychology, 35*(4), 267–276. https://doi.org/10.1037/spq0000374

Qualter, P., Whiteley, H. E., Hutchinson, J. M., & Pope, D. J. (2007). Supporting the development of emotional intelligence competencies to ease the transition from primary to high school. *Educational Psychology in Practice, 23*(1), 79–95. https://doi.org/10.1080/02667360601154584

Seligman, M .E .P., & Csikszentmihalyi, M. (2000). Positive psychology. *American Psychologist, 55(*1), 5–14. https://psycnet.apa.org/doi/10.1037/0003-066X.55.1.5

Shepherd, J., Oliver, M., & Schofield, G. (2015). Convergent alidity and test–retest reliability of the authentic happiness inventory in working adults. *Social Indicator Research, 124,* 1049–1058. https://doi.org/10.1007/s11205-014-0812-6

Taheri, A., Pourshahriari, M., Abdollahi, A., Hosseinian, S., Allen, K. A. (2020). Psychometric assessment of the Persian translation of the Social and Emotional Health Survey-Secondary (SEHS-S) with female adolescents. *International Journal of Mental Health,* 1–17. https://doi.org/10.1080/00207411.2020.1843965

Telef, B. B., & Furlong, M. J. (2017). Adaptation and validation of the Social Emotional Health Survey-Secondary into Turkish culture. *International Journal of School & Educational Psychology, 5,* 255–265. https://doi.org/10.1080/21683603.2016.1234988

Turban, J. L., King, D., Li, J. J., & Keuroghlian, A. S. (2021). Timing of social transition for transgender and gender diverse youth, K-12 harassment, and adult mental health outcomes. *Journal of Adolescent Health,* https://doi.org/10.1016/j.jadohealth.2021.06.001

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

White, J. (1984). *The psychology of Blacks: An Afro-American perspective.* Prentice Hall.

Whittaker, T. A., & Stapleton, L. M. (2006). The performance of cross-validation indices used to select among competing covariance structure models under multivariate nonnormality conditions. *Multivariate Behavioral Research, 41*(3), 295–335. https://doi.org/10.1207/s15327906mbr4103_3

You, S., Dowdy, E., Furlong, M. J., Renshaw, T., Smith, D. C., & O'Malley, M. D. (2014). Further validation of the Social and Emotional Health Survey for high school students. *Applied Quality of Life Research, 9*, 997–1015. https://doi.org/10.1007/s11482-013-9282-2

You, S., Furlong, M. J., Felix, E., & O'Malley, M. D. (2015). Validation of the Social and Emotional Health Survey for five sociocultural groups: Multigroup invariance and latent mean analyses. *Psychology in the Schools, 52,* 349–362. https://doi.org/10.1002/pits.21828

Tables

Table 1

Double Cross Validation of the Full SEHS-S-2020 Hypothesized Model in Middle School Students

Model	AIC	BIC	SABIC	LL	ΔLL	nPAR	Δ*df*	*p*
Calibration Free	73575.43	74183.99	73790.16	-36663.72		124		
Calibration Fixed	73638.88	73638.88	73638.88	-36819.44	311.45	0	124	< .001
Validation Free	75448.91	76057.47	75663.64	-37699.45		124		
Validation Fixed	75546.78	75546.78	75546.78	-37773.39	345.88	0	124	< .001

Note. AIC = Akaike information criterion; BIC = Bayes information criterionn;. SABIC = sample size adjusted Bayes information criterion;. nPAR = number of free parameters; LL = loglikelihood; ΔLL = loglikelihood difference.

Table 2

Invariance Across Grade Level

Model	c2	*df*	Δc2	Δ*df*	RMSEA	90% CI	CFI	SRMR	ΔCFI	ΔRMSEA	ΔSRMR
CFA											
Both	10038.69	578	—	—	.042	[.041, .042]	.959	.042	—	—	—
7th Grade	5272.16	578	—	—	.042	[.040, .043]	.957	.043	—	—	—
8th Grade	5539.35	578	—	—	.043	[.042, .044]	.958	.043	—	—	—
MI Level 1											
Configural	7946.91	1056	—	—	.037	[.036, .038]	.970	.032	—	—	—
Metric	8017.91	1092	71.00	36	.037	[.036, .037]	.970	.037	< .001	< .001	.005
Scalar	8270.81	1128	252.90	36	.037	[.036, .037]	.969	.041	.001	< .001	.003
MI Level 2											
Configural	10688.72	1176			.041	[.041, .042]	.958	.042	—	—	—
Metric	10784.16	1212	95.44	36	.043	[.041, .042]	.958	.043	< .001	.002	.001
Scalar	10914.12	1224	129.96	12	.041	[.040, .042]	.958	.044	< .001	.002	.001
MI Level 3											
Configural	10994.81	1188	—	—	.042	[.041 .043]	.957	.043	—	—	—
Metric	11091.77	1224	96.96	36	.041	[.041, .042]	.957	.043	< .001	.001	< .001
Scalar	11172.12	1228	80.35	4	.041	[.041, .042]	.957	.045	< .001	< .001	.002

Note. CFA = Confirmatory Factor Analysis. Level 1 refers to invariance for lower-order factors. Level 2 refers to the second-order factors, and Level 3 refers to the higher-order factor. RMSEA = root mean square error of approximation; CFI = comparative fit index; SRMR = standardized square root mean residual.

Table 3

Invariance Across Gender Identification

Model	c2	*df*	Δc2	Δ*df*	RMSEA	90% CI	CFI	SRMR	ΔCFI	ΔRMSEA	ΔSRMR
CFA											
Both	10038.69	578	—	—	.042	[.041, .042]	.959	.042	—	—	—
Male	5011.42	578	—	—	.041	[.040, .042]	.960	.043	—	—	—
Female	5404.17	578	—	—	.042	[.041, .043]	.958	.041	—	—	—
MI Level 1											
Configural	7794.03	1056	—	—	.037	[.036, .038]	.970	.032	—	—	—
Metric	7986.74	1092	192.71	36	.037	[.036, .038]	.969	.038	.001	< .001	.006
Scalar	9582.10	1128	1595.36	36	.040	[.039, .041]	.962	.050	.007	.003	.012
MI Level 2											
Configural	10469.32	1176	—	—	.041	[.041, .042]	.959	.041	—	—	—
Metric	10619.76	1212	150.44	36	.041	[.040, .042]	.958	.042	.001	< .001	.001
Scalar	12141.98	1224	1522.22	12	.044	[.043, .045]	.952	.047	.006	.003	.005
MI Level 3											
Configural	11826.70	1188	—	—	.044	[.043, .045]	.953	.045	—	—	—
Metric	11970.08	1224	143.38	36	.043	[.043, .044]	.952	.046	.001	.001	.001
Scalar	12404.39	1228	434.31	4	.044	[.044, .045]	.950	.048	.002	.001	.002

Note. CFA = Confirmatory Factor Analysis. Level 1 refers to invariance for lower-order factors. Level 2 refers to the second-order factors, and Level 3 refers to the higher-order factor. RMSEA = root mean square error of approximation; CFI = comparative fit index; SRMR = standardized square root mean residual.

Table 4

Invariance Across Hispanic/Latinx Identification

Model	c2	*df*	Δc2	Δ*df*	RMSEA	90% CI	CFI	SRMR	ΔCFI	ΔRMSEA	ΔSRMR
CFA											
Both	10038.69	578	—	—	.042	[.041, .042]	.959	.042	—	—	—
Hispanic	5346.77	578	—	—	.042	[.041, .043]	.958	.042	—	—	—
NonHispanic	5453.40	578	—	—	.043	[.042, .044]	.957	.043	—	—	—
MI Level 1											
Configural	7932.40	1056	—	—	.037	[.037, .038]	.970	.031	—	—	—
Metric	8001.15	1092	68.75	36	.037	[.036, .038]	.969	.036	.001	<.001	.005
Scalar	8485.20	1128	484.05	36	.037	[.037, .038]	.967	.041	.002	<.001	.005
MI Level 2											
Configural	10850.41	1176	—	—	.042	[.041, .043]	.957	.042	—	—	—
Metric	10934.91	1212	84.50	36	.042	[.041, .042]	.957	.043	< .001	< .001	.001
Scalar	11128.33	1224	193.42	12	.042	[.041, .042]	.956	.045	.001	< .001	.002
MI Level 3											
Configural	11113.93	1188	—	—	.042	[.042, .043]	.956	.043	—	—	—
Metric	11195.27	1224	81.34	36	.042	[.041, .043]	.956	.043	.001	< .001	< .001
Scalar	11370.66	1228	175.39	4	.042	[.041, .043]	.955	.046	.001	< .001	.003

Note. CFA = Confirmatory Factor Analysis. Level 1 refers to invariance for lower-order factors. Level 2 refers to the second-order factors, and Level 3 refers to the higher-order factor. RMSEA = root mean square error of approximation; CFI = comparative fit index; SRMR = standardized square root mean residual.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- xSupplementalMaterialSEHSSJHSNov03Submitted.docx