Further Validation of the Social and Emotional Health Survey for High School Students

SUKKYUNG YOU
College of Education, Hankuk University of Foreign Studies, Seoul, Korea

MICHAEL J. FURLONG AND ERIN DOWDY
Department of Counseling, Clinical, and School Psychology, University of California Santa Barbara, Santa Barbara, California, USA

TYLER L. RENSHAW
Department of Psychology, Louisiana State University

DOUGLAS C. SMITH
Department of Psychology, Southern Oregon University

MEAGAN D. O’MALLEY
WestEd, Los Alamitos, California USA

Correspondence regarding this article should be addressed to Sukkyung You, Ph.D., College of Education, Hankuk University of Foreign Studies, 270 Imun-dong, Dongdaemun-Gu, Seoul 130-791, Korea, E-mail: skyou@hufs.ac.kr
Further Validation of the Social and Emotional Health Survey

Abstract

The Social Emotional Health Survey (SEHS) was developed to assess core building blocks of adolescent positive psychosocial development and was validated in a previous study (Furlong, You, Renshaw, Smith, & O’Malley, 2013). Using an entirely new sample, the present study extended information about the SEHS convergent and divergent validity by coadministering it with the Behavioral Emotional Screening System (BESS). The sample included 2,240 students in Grades 9-12 from two comprehensive high schools located in a major west coast USA city. A majority of the students were of Latino/a heritage (72%) and were experiencing disadvantaged economic circumstances (80% at school 1 and 68% at school 2). Predictive validity was examined by comparing SEHS scores collected at the start of an academic year with the end-of-first-term grade point average. Confirmatory factor analyses supported the original SEHS factor structure composed of the first-order constructs of belief-in-self, belief-in-others, emotional competence, and engaged living, which parsimoniously mapped on to a second-order “coviability” factor. Complete factorial invariance was found across four groups formed by crossing gender (male, female) and age (ages 13-15, ages 16-18). Latent means analysis found some small to moderate effects size differences, primarily for the belief-in-self and belief-in-others first-order latent traits. An SEM analysis found that the SEHS measurement model, including coviability was a significant negative predictor of psychological distress as measured by the BESS and was positively associated with students end-of-term grade point average. The discussion focuses on implications for conceptualizing the core psychological components of adolescents’ positive quality of life and how schools can use the SEHS as part of a whole-school procedure to screen for students’ complete mental health.

Keywords: Social Emotional Health Survey, coviability, belief-in-self, belief-in-others, emotional competence, engaged living, school, adolescent, complete mental health, validity, confirmatory factor analysis, latent means analysis, grade point average
Further Validation of the Social and Emotional Health Survey for High School Students

1. Introduction

1.1 Surveying Students’ Positive Mental Health

School-based surveillance surveys have predominately focused on assessing the nature and frequency of students’ substance use, aggressive behavior, and other risky behaviors (e.g., Youth Risk Behavior Surveillance Survey; Eaton et al. 2012). Although these surveys provide useful information that helps schools and their communities serve high-risk students, their lopsided focus on the negative—or unhealthy—aspects of student experiences has some limitations. For example, given that many risky behaviors, such as substance use, are either low prevalence or low frequency behaviors, a majority of the youths are asked to respond to scores of questions that do not directly match with their personal experiences (e.g., Zhang, Truman, Snyder and Robers 2011). As a result, students taking these surveillance surveys might begin to question the purpose and relevance of the survey itself, wondering if it is important to respond carefully (Cornell, Klein, Konold and Huang 2012). Additionally, although youth involvement in risky behaviors is clearly of public health and educational concern, the predominant surveillance practices provide limited information about the life conditions and experiences of the majority of youths who report limited involvement in risky behaviors. This can create circumstances in which school systems are put in the awkward position of reporting negative results to constituents using a positive spin. For instance, when reporting the positive information from a surveillance survey that “70% of students did not use marijuana,” concerned parties such as school board members and parents often state, “So, this means 30% of our students do use marijuana.”

Another limitation of many surveillance surveys is that their scope is unbalanced, focusing mostly on negative indicators that have been shown to be associated with student distress and school failure, while largely ignoring indicators of positive youth development that are associated with students’ well-being, school success, and overall quality of life, even for the youths who are engaging in developmentally risky behaviors (Huebner, Antaramian and Heffner 2012). If a goal of quality-of-life research is to provoke students, parents, educators, and policy makers to give greater attention to positive development indicators, then school-based surveillance surveys are needed that produce conceptually meaningful and practical information about factors that are positively associated with and promote thriving youth development.

Within the past couple decades, positive youth development as a perspective to enhance youths’ quality of life has received increasing scholarly attention in several research domains. For example, within the subfield of youth mental health, studies have found that both the presence of psychological distress and the absence of psychological well-being are associated with impairments in school performance, and that consideration of both positive and negative indicators of mental health had additive value in predicting students’ attendance and academic achievement over time (Antaramian, Huebner, Hills and Valois 2010; Dowdy, Furlong and Sharkey 2013; Shaffer-Hudkins, Suldo, Loker and March 2010; Suldo and Shaffer 2008; Suldo, Thalji and Ferron 2011). Additionally, results from resilience studies have shown that increased numbers of external assets (e.g., supportive family and school relationships) and internal assets (e.g., achievement motivation and school engagement) are positively associated with desirable quality-of-life outcomes, such as academic achievement, physical health, and helping behaviors, as well as negatively associated with disruptive life outcomes, including substance use, violence perpetration, and victimization (Evans, Marsh and Weigel 2010; Scales 1999; Scales, Benson, Leffert and Blyth 2000; Scales, Benson, Roehlkepartain, Semsa and Van Dulmen 2006). Moreover, psychological research indicates that various positive traits (e.g., optimism and school connectedness) are predictive of emotional distress, school adjustment and success, and physical health (e.g., Boman, Furlong, Shochet, Lilles and Jones 2009; Kirschman, Johnson, Bender and Roberts 2009). Social-emotional learning (SEL) research has produced empirical evidence demonstrating that personal abilities or skills (e.g., self-awareness and behavioral regulation) are associated with better school and quality-of-life outcomes (e.g., Durlak, Weissberg, Dymnicki, Taylor and Schellinger 2011; Zins, Bloodworth, Weissberg and Walberg 2007). Taken together, these findings across several research domains suggest that efforts to enhance youths’ quality of life require a balanced approach that includes both efforts to understand and cultivate positive dimension of youths’ development along with efforts to ameliorate involvement in negative or unhealthy behaviors.

Given the potential value of considering the combinatorial effects of positive indicators of youth
development, we have undertaken to validate a psychometrically sound, practically feasible, school-based assessment as a compliment to risk-oriented surveillance surveys, such as the Youth Risk Behavior Surveillance Survey (Eaton et al. 2012), and emotional and behavioral problem screening instruments, such as the Behavior Assessment System for Children—2 Behavioral and Emotional Screening System (BESS; Kamphaus and Reynolds 2007) and the Strengths and Difficulties Questionnaire (Van de Looij-Jansen, Goedhart, de Wilde and Treffers 2011). To accomplish this, in collaboration with WestEd, a nonprofit public research and development agency, and the California Department of Education we developed and tested the Social and Emotional Health Survey (SEHS) for secondary students. The SEHS assesses several components of positive mental health—or what we refer to as positive psychological building blocks—that were drawn from various interrelated subfields of inquiry that are concerned with positive youth development. Furlong, You, Renshaw, Smith and O’Malley (2013) reported on the SEHS’s preliminary development and psychometric properties and the present study provides enhanced analyses using an entirely new sample of adolescents.

1.2 The Social and Emotional Health Survey

The SEHS has 12 subscales, each of which represents a unique positive mental health construct, that contribute to four positive mental health domains. The first domain, belief-in-self, consists of three subscales grounded in constructs from the SEL literature: self-efficacy, self-awareness, and persistence (e.g., Durlak et al. 2011; Shechtman, DeBarger, Dornsife, Rosier and Yarnall 2013). The second domain, belief-in-others, is comprised of three subscales derived from constructs found mostly in the childhood resilience literature: school support, peer support, and family support (e.g., Larson 2000; Masten, Cutuli, Herbers and Reed 2009). The third domain, emotional competence, consists of three subscales also based on constructs drawn from the SEL scholarship: emotional regulation, empathy, and behavioral regulation (e.g., Greenberg et al. 2003; Zins et al. 2007). Engaged living, the final domain, is comprised of three subscales grounded in constructs derived from the positive youth psychology literature: gratitude, zest, and optimism (e.g., Gilman, Huebner and Furlong 2009; Kirschman et al. 2009). A representation of SEHS’s subscales and measurement model is shown in Figure 1. A more detailed review of each of these scales and their associated constructs, and a description of the conceptual rationale underlying the SEHS, including a discussion of the empirical merit of each of the 12 positive-psychological building blocks, is provided by Renshaw et al. (in press).

In addition to contributing to the four positive mental health domains described above, the 12 positive mental health indicators included in the SEHS measurement model are also hypothesized to contribute to a single latent metacronstruct called covitality. As the counterpart to the comorbidity construct, covitality is conceptualized as the synergistic effect of positive mental health resulting from the interplay among multiple positive psychological building blocks. Statistically, covitality is a second-order positive mental health construct that accounts for the presence of several co-occurring, first-order positive mental health indicators. Findings from our initial study of the development of the SEHS confirmed the psychometric viability of the 12 positive psychological building blocks, the four positive mental health domains they contribute to, as well as the overarching covitality construct (Furlong, You, Renshaw, Smith and O’Malley, 2103). Specifically, results indicated that students’ covitality level was highly predictive of their subjective well-being (represented by measures of life satisfaction paired with positive and negative affect) and various self-reported quality-of-life outcomes, including academic achievement, school safety, depressive symptoms, and substance use (Furlong, You, Renshaw, Smith and O’Malley 2013). These findings are similar to those reported in other recent studies, where covitality was found to be a parsimonious and effective predictor of college students’ internalizing symptoms and overall adjustment (Jones, You and Furlong 2012) as well as elementary-school students’ self-reported prosocial behavior, caring relationships, school acceptance, and school rejection (Furlong, You, Renshaw, O’Malley and Rebelez 2013).

1.3 Purposes of the Present Study

The purposes of the present study were twofold. First, it aimed to replicate the psychometric characteristics of the SEHS found in its initial development investigation (i.e., strong factor loadings for the 12 core constructs, the four positive mental health domains, and the overall covitality construct, as well as complete structural invariance for both females and males; Furlong, You, Renshaw, Smith and O’Malley 2013). The present study used a new sample of secondary school students. In the original investigation of the SEHS, the item-response formats for each
of the 12 subscales were maintained from their respective source measures and, as a result, varied across scales. In the present study, however, we adopted a more uniform item-response format (described in the Measures section), reasoning that such standardization might enhance the SEHS’ social validity and interpretability for researchers and practitioners, and that it might help limit potential invalid response patterns; hence, further clarifying its underlying conceptual structure. In addition, the present study expanded the original analyses by examining multigroup invariance across four gender by age groups: (male, female) x (younger adolescents [13-15 years], older adolescents [16-18 years]). Given Furlong and colleagues’ original findings, we hypothesized that the SEHS latent structure and overall measurement invariance would be reconfirmed in the present study.

Additionally, this study extended previous research by examining the convergent and divergent validity of the SEHS with the BESS (Kamphaus and Reynolds 2007), which is a measure of students’ emotional and behavioral symptoms. Previous research was extended by also examining the relation between students’ covitality level assessed at the beginning of the school year and actual (instead of self-reported) school grades achieved at the end of the first school semester. Given Furlong, You, Renshaw, Smith and O’Malley’s (2013) findings regarding the positive relation of covitality with self-reported academic achievement, we hypothesized that secondary students’ covitality level would predict actual (objective) course grades—suggesting that, in addition to assessing student risk and problems, schools might find additional benefit from surveying and attending to indicators of students’ positive mental health factors, as assessed by the SEHS.

2. Method
2.1 Participants

The participants in this study were enrolled in two comprehensive high schools. All students in Grades 9–12 were invited to participate, with 2,240 of the 2,988 eligible students completing the survey for a participation rate of 75% (most nonparticipating students were absent on the day of the survey). For the confirmatory factor analyses described later, two randomly split subsamples (using SPSS Version 20 case selection random sample utility) were created, with subsample 1 (S1) and subsample 2 (S2) both having 1,120 students. The samples’ gender proportions were comparable (S1: 46% female, 54% male; S2: 47% female, 53% male). The students ranged in age from 13 to 18 years and both subsamples had the same mean age of 15.5 years (SD = 1.2). A majority of the students (S1: 73%; S2: 71%) reported that they identified as being of Latino/a heritage.

The schools participating in this study were located in a major urban area in Southern California that served many students who were considered to be economically disadvantaged based on California educational criteria (S1: 80%; S2: 68%). Reflective of these socioeconomic circumstances, these schools had low four-year graduation rates (S1: 47%; S2: 68%) and inconsistent attendance with low proportions of students having 96% or higher daily school attendance (S1: 53%; S2: 59%). These schools had stable teaching staffs with a majority of the teachers being at one of the participating schools for three or more years (S1: 90%; S2: 85%). With respect to campus climate, most students reported feeling safe at school (S1: 90%; S2: 87%).

2.2 Measures
2.2.1 Social Emotional Health Survey (SEHS)

The SEHS is a modification and extension of the Resilience Youth Development Module (RYDM) that is part of the California Healthy Kids Survey (see Furlong, Ritchey and O’Brennan 2009; Hanson and Kim 2007). Furlong, You, Renshaw, Smith and O’Malley (2013) found evidence supporting the multidimensional conceptual model that motivated its development. The SEHS has 12 subscales (three items per subscale) that map on to the following four latent traits with the source of the items for each subscale noted: belief-in-self (self-awareness, Hanson and Kim 1997; persistence, Lufi and Cohen 1987; self-efficacy, Hanson and Kim 2007); belief-in-others (school support, Hanson and Kim 2007; family coherence, Bloom 1985; peer support, Hanson and Kim 2007); emotional competence (empathy, Hanson and Kim 2007; self-control, Rohrbeck Azar and Wagner 1991; delay of gratification, Furlong, Sharkey, Boman and Cladwell 2007); and engaged living (gratitude, Froh, Yurkewicz and Kashdan 2009; zest, Terry, Lane, Lane and Keohane 1999; optimism, Ey et al. 2005). Support was found for a structural model that included the single higher-order latent trait, which was called covitality (see Figure 1).

For this study, we slightly modified the response options for 10 of the 12 subscales (excluding gratitude and zest) to create a more standardized instrument. These response options were: 1 = not at all true of me, 2 = a little
true of me, 3 = pretty much true of me, and 4 = very much true of me. For the gratitude and zest subscales, the following response options were used as they referred to frequency of experience: 1 = not at all, 2 = very little, 3 = somewhat, 4 = quite a lot, 5 = extremely. The 36 SEHS items are shown in Table 1. For the total sample used in the present study, the internal consistency reliabilities for the four second-order latent traits were: belief-in-self (α = .76), belief-in-others (α = .81), emotional competence (α = .78), and engaged living (α = .87). The alpha for the combined 36-item total covitality score was .91, which compares to .92 in a previous study (Furlong, You, Renshaw, Smith and O’Malley 2013).

2.2.2 Behavioral and Emotional Screening System Student Form (BESS)

The Behavioral and Emotional Screening System Student Form (BESS) is a 30-item self-report measure designed to identify behavioral and emotional risk in youths Grades 3 through 12. Four response options—never, sometimes, often, and almost always—are provided for each item and the sum of the items generates a total T score with higher scores reflecting more problems (Kamphaus and Reynolds 2007). For reviews of the BESS see Furlong and O’Brennan (2010) and Johnson (2010).

Based on exploratory and confirmatory factor analyses, four subscale scores (including one adaptive scale and three problem scales) were identified that used 27 of the 30 items in the full BESS Student form (see Dowdy et al. 2011). Based on responses from the current sample, subscale scores for the three problem scales were calculated by obtaining the mean of the items that loaded onto each factor. Dowdy et al. (2011) provide a more detailed description of subscale creation and characteristics and a description of the items that correspond with each subscale. For the total sample used in the present study, the Cronbach’s alpha for each of the three problem subscales were: Inattention/Hyperactivity (5 items, α = .61); Internalizing (10 items, α = .80); and School Problems, (4 items, α = .74).

2.2.3 Course Grading Marks

The SEHS was administered one month after the beginning of the school year’s first semester. We subsequently obtained first semester course grading marks in January for 1,531 students from one of the participating high schools. Most of the students (73.9%) took a full schedule of eight courses, with some taking seven courses (23.0%), six courses (0.4%), and no course marks available for 42 (2.7%) of the students who had taken the SEHS. Due to the different number of courses the students were enrolled in, we counted the number of A, B, C, D, and F grades each student had and computed a grade point average (GPA) as follows: ([A Grades * 4] + [B Grades * 3] + [C Grades * 2] + [D Grades * 1] + [F Grades * 0]) / N of courses. The GPA ranged from 0.0 to 4.0, with 2.0 equivalent to course grading marks of C’s in all classes.

2.3 Procedure

The SEHS and the BESS were administered in September 2012 to students in a group format during regular school hours at both high schools on the same day. Survey administration was proctored by university faculty and trained graduate students. Parental consent was obtained following California educational policy procedures and as approved by the authors’ institutional review board. Because the survey responses were not anonymous, the university institutional review board required that a phone call be made to all parents who returned a signed form indicating that they did not want their child to participate in either the research (n = 8) or the research and the screening (n = 27). This was to inform the parents that their request was respected. In addition, the students were fully informed that the survey was not anonymous. They were informed that the survey was being conducted to assist the student care teams at each school with finding ways to better support students. After receiving the instructions, the students were informed that they were not required to complete the survey and could opt out with no repercussions. The SEHS was administered in a paper-and pencil format and students completed the BESS by using a scanable response form. Class rosters including student names and birthdays were used to provide unique student identifiers. At the end of the semester, archival data (grades) were collected through an examination of the student database. Identifying information was removed from all files after data entry, processing, and merging the grades, SEHS, and BESS responses accomplished using unique student identifiers.

2.4 Overview of the Statistical Analyses

Factor analyses were conducted in two stages. In stage 1, using a split-half of the total sample (S1), confirmatory factor analysis (CFA) was employed to test the fit of the previously known factor structure of the
Further Validation of the Social and Emotional Health Survey

SEHS. In stage 2, using S2, structural equation modeling was used to test two alternative factor structures of the SEHS and invariance across age by gender groups in a series of multigroup CFAs. The invariance testing process involved several steps in which increasingly restrictive levels of measurement invariance were explored. Three levels of measurement invariance were tested in the following order: configural, metric, and scalar (Steenkamp and Baumgartner 1998). Configural invariance tested if the same basic factor structure held across age by gender groups. This level of invariance was designed to examine whether the patterns of zero and nonzero factor pattern coefficients were equivalent across groups and to establish baseline models with adequate fit for the subsequent measurement invariance testing. This analysis provided information to evaluate if the SEHS subscales fit for the age by gender groups compared. If configural invariance is established, metric invariance is tested. Metric invariance tested the extent to which the relations between the factors and the items were equivalent across the groups. This analysis provided information to evaluate the equivalence of the factor loadings on the SEHS subscales. If latent factors have equal loadings across groups, this provides evidence that each age by gender group responded to the items in the same way. Thus, any differences in the latent factors are comparable across groups; that is, observed group differences in the underlying latent factors. The last step of measurement invariance testing is scalar invariance. It tested the equality of intercept terms to see whether the four age by gender groups used the response scales in a similar way. If this invariance test is met, meaningful comparisons of latent means considering age and gender groups can be made.

In the present study, for all analyses, the degree of model fit was assessed using several criteria: the Satorra-Bentler scaled statistic, comparative fit index (CFI; Bentler 1990), standardized root-mean-square residual (SRMR), and root-mean-square error of approximation (RMSEA; Steiger and Lind 1980) with a 90% confidence interval. Preliminary examination of students’ responses showed that these data were multivariately kurtose; hence, all analyses were based on robust statistics. Satorra-Bentler scaled statistic (S-B \( \chi^2 \)) was used because it provides a correction to the test statistics and standard errors when data are non-normally distributed. We used the two-index strategy advanced by Hu and Bentler (1999). Specifically, SRMR was examined with a value lower than .08 desired. In addition to acceptable SRMR, values lower than .08 for the RMSEA were used to determine a good-fitting model. In reporting on evidence of invariance, two criteria must be met. The first criterion is that the multigroup model exhibits an adequate fit to the data. Cheung and Rensvold (2002) recommended that the differences in CFI values between models are smaller than or equal to .01, which indicates that the null hypothesis of invariance should not be rejected. Further, Lagrange multiplier (LM) test modification indices were examined to find which equality constraints are untenable.

3. Results
3.1 Construct Validity
3.1.1 Confirmatory Factor Analysis

Using S1 \( (n = 1,120) \), a CFA was conducted to test the fit of the previously known SEHS factor structure. The model adequately fit the data, \( \chi^2 = 2598.70, df = 582, p < .05; \) SRMR = .062; RMSEA = .056, 90% CI [ .053, .058]. As expected, each item showed good factor loadings on the corresponding factor. All parameter estimates were found to be statistically significant \( (p < .01, \) see Table 1).

Next, a CFA was assessed on S2 \( (n = 1,120) \) using the EQS (V6.1) structural equation modeling program (Bentler, 2006) to validate the identified factor structure found with the S1 analysis. As with any measure, additional research is needed to verify the factor structure of the SEHS, therefore, several alternative factor structures were tested to identify plausible models that could explain the relations among the items. Recognizing that the four core positive psychology constructs were significantly correlated, Model 1 tested a fully-correlated model. It was found that the items loaded on to their respective latent constructs: belief-in-self, belief-in-others, social-emotional competence, and engaged living (all loadings ranged from .41 to .75) and the model adequately fit the data, \( \chi^2 = 269.87, df = 48, p < .05; \) SRMR = .046; RMSEA = .064, 90% CI [ .060, .066]. Model 2 extended the analysis by testing a second-order latent factor model with the four first-order latent constructs loading onto a general latent factor, which we labeled covitality. The model suggested an adequate fit to the data, \( \chi^2 = 298.91, df = 50, p < .05, \) SRMR = .048; RMSEA = .067, 90% CI [ .061, .069]. Both models yielded close fit to the data; therefore, we made a decision based on both statistical criteria and conceptual grounding. Since parsimony is one of the criteria for model...
selection and the four first-order SEHS constructs loaded significantly on the second-order latent construct, covitality, the second-order latent factor model was selected over the correlated four-factor model as the preferred solution. Therefore, the hypothesized second-order factor model was supported for the SEHS and was then used in the following primary analyses.

3.1.2 Multigroup Invariance Testing

As previously mentioned, measurement invariance testing was performed in three steps: configural, metric, and scalar. The second-order factor model was conducted using gender by age groups. All four groups showed adequate fit to the data: age 13-15/male group, $\chi^2 = 97.14$, $df = 50$, $p < .05$, SRMR = .054; RMSEA = .057, 90% CI [.052, .060]; age 13-15/female group, $\chi^2 = 113.97$, $df = 50$, $p < .05$, SRMR = .053; RMSEA = .067, 90% CI [.062, .070]; age 16-18/male group, $\chi^2 = 110.57$, $df = 50$, $p < .05$, SRMR = .053; RMSEA = .065, 90% CI [.060, .069]; age 16-18/female group, $\chi^2 = 101.10$, $df = 50$, $p < .05$, SRMR = .053; RMSEA = .063, 90% CI [.060, .067]. For each of these four groups, the factor loadings were of all of satisfactorily magnitude and were statistically significant at the $p < .01$ level. Because the same factor structure was tenable across the four gender by age groups, configural invariance was ascertained.

Metric and scalar invariance results are displayed in Table 2. First, Model 2 constrained all factor loadings to be equal across gender groups. Comparing Model 1 (baseline model) and Model 2, $\Delta$CFI was less than .01, indicating that the latent factors had the same effect on all of their respective observed indicators. Scalar invariance was evaluated as the last step. The full scalar invariance model held based on acceptable change in ACFI. In sum, the results suggested that the second-order factor model showed sufficient invariance across the four gender by age groups.

3.1.3 Test of Latent Mean Differences

Given that the assumptions of configural, metric, and scalar invariance were satisfied, the next step tested for latent means differences. We examined mean differences within the two age groups (ages 13-15 years and 16-18 years) with males set as the reference group for each age group (see Table 3). Results showed there were significant mean group differences with respect to SEHS factors except for emotional competence; however, the pattern of significant mean differences differed across the two age groups. For the 13 to 15 years age group, females more strongly endorsed belief-in-others items than males, but the males more strongly endorsed belief-in-self items than females. For the age 16 to 18 years group, males reported higher belief-in-self scores than females, but the females reported higher engaged living than males.

3.2 Predictive Validity

3.2.1 Test of Path Model for Emotional and Behavioral Problems

To further examine the associations among the four identified first-order SEHS constructs, the hypothesized second-order covitality construct, and the students’ BESS responses, a structural model was conducted from covitality to the outcome variable—BESS composite problem score (see Figure 2). As expected, the analysis revealed a significant positive relation to BESS with the overall model having good fit to the data, $\chi^2 = 1085.27$, $df = 85$, $p < .05$, SRMR = .058; RMSEA = .072, 90% CI [.068, .074]. Figure 2 presents the standardized coefficients of the final path model.

3.2.2 Course Grade Point Average (GPA)

We first computed a covitality composite score for each student by summing the responses across all 36 items. We found that the total covitality score provided a range of scores both above and below the mean (range = 36–150, $M = 112.19$, $SD = 15.72$, skewness = -.028, kurtosis = -.004). The covitality scores were then transformed to z-scores, which were used to form four covitality groups: very low (scores < -1.0 $SD$, $n = 199$), low (scores -1.0 to 0 $SD$, $n = 463$), high (score > 0 and < +1.0 $SD$, $n = 531$), and very high (scores > +1 $SD$, $n = 255$). A one-way ANOVA tested the relation between students’ covitality level and GPA and yielded a main effect, $F (3, 1363) = 18.893, p < .0001, R^2 = .04$. Tukey post-hoc tests indicated that the very high and high covitality groups (both with $M = 2.6, SD = .8$) had higher GPAs than the low ($M = 2.3, SD = 0.9$) and very low covitality groups ($M = 2.2, SD = 0.8$).

4. Discussion
The primary aim of the present study was to replicate and extend analyses that first provided support for the psychometric properties of the adolescent SEHS. Consistent with a previous study (Furlong, You, Renshaw, Smith and O’Malley 2013), confirmatory factor analyses replicated the SEHS structure by once again showing that all 36 items loaded uniquely on to their respective 12 base subscales (item loadings ranged from .52 to .90 in the present study compared with .63 to .94 in a previous study; Furlong, You, Renshaw, Smith and O’Malley 2013), and that the 12 base subscales loaded on to the four proposed first-order latent traits: belief-in-self, belief-in-others, emotional competence, and engaged living. Given that the SEHS is based on a conceptual model proposing that the combination of positive psychological building blocks might provide an efficient development index associated with adolescents’ quality of life, we were encouraged to see that the higher-order structural model including covitality was supported as the most parsimonious organization of the SEHS latent trait structure.

This study further complemented previous research by showing evidence of divergent validity in that a structural model including the covitality trait was predictive of students’ self-reported emotional and behavioral problems, whereas previous research had examined its association with subjective well-being. An additional contribution was that the present study reported a significant predictive relation with students’ actual course grades. This provided the first evidence of a link between covitality and an objective, non self-reported indicator, which is consistent with other studies that have found that students’ subjective well-being (a construct correlated with covitality) predicts course grades (e.g., Suldo et al. 2011; Suldo, Riley, and Shaffer 2006).

Results of this study provide further evidence of sufficient invariance across four gender by age groups. These results replicated previous findings of structural invariance for both females and males (Furlong, You, Renshaw, Smith and O’Malley 2013) using a new sample of adolescents and extended analyses by examining differences across younger and older adolescents. Although overall measurement invariance was confirmed, some latent mean differences across gender were found. When compared to males, both younger and older females had significantly lower self-ratings on the belief-in-self (self-efficacy, self awareness, persistence) items. In contrast, when compared to males, younger females had higher self-ratings on the belief-in-others (school support, family coherence, peer support) items and older females had higher ratings on the items assessing engaged living (gratitude, zest, optimism) These findings are consistent with prior research documenting gender differences in a variety of these constructs, such as self-efficacy (Meece, Gliemke and Burg 2006), social support (Dalgard et al. 2006), and optimism (Orejudo, Puyuelo, Fernández-Terrado and Ramos 2012). Although the balance of ratings across all SEHS constructs found no gender differences for younger adolescents and small effect size differences for older adolescents, additional research is needed to further examine gender and age-related differences in the SEHS.

**Conceptual and Research Considerations**

Several research domains (positive youth development, resilience, positive psychology, self-determination), posit that the combination of internal assets have an additive effect as it relates to youth coping and adaptation (e.g., Scales et al. 2006). These conceptual perspectives influenced the development of the SEHS, which is an attempt to provide researchers and educators an efficient measurement that captures the totality of core adolescent psychological assets. We have proposed that these core psychological assets—belief-in-self, belief-in-others, emotional competence, and engaged living—represent positive psychological self-schemata (see Dozois et al. 2012; Markus 1997) that emerge as part of normal youth development and represent the youth’s evolving sense of who they are and their place within their social niches (Renshaw et al. in press). A possible conceptual implication of this study’s findings for quality-of-life research is that it reinforces the need for developmental models that are not built primarily on lower-order, narrow constructs. For example, there is an abundance of meaningful, important research linking social-emotional development (e.g., social-emotional-learning; Durlak et al. 2011) and positive traits (e.g., hope [Marques, Lopez, Rose Robinson in press] and gratitude [Bono, Froh Forrett in press]) to positive mental health, well-being and school success. The SEHS model acknowledges this body of research, and includes components from its research in its measurement model. In addition, what we are proposing is that it might be useful to consider how these narrower constructs’ shared variance is linked with higher-order latent traits, as measured by the SEHS. As an example of this, using a college-age sample Jones et al. (2012) coadministered 40 items from six positive constructs (self-efficacy, hope, life satisfaction, optimism, happiness, and gratitude) and found that in a cross-instrument factor analysis, 19 items were dropped due to double loadings. By addressing the
oft overlooked issue of shared measurement error by developing a set of 36 items with high, subscale-unique loadings, the SEHS offers researchers a possible way to examine correlates and predictors of adolescents’ quality of life with greater measurement precision. That said, the measurement model underlying the SEHS is not a settled matter; rather, we offer it as a parsimonious, well-rounded model for capturing core positive-psychological building blocks that contribute to students’ well-being, school success, and overall quality of life.

**Educational Applications**

Although the SEHS is grounded in a cognitive organization of adolescent-constructed self-schemata, it can also be considered within a broader transactional-ecological framework. The SEHS focuses on what adolescents bring to their various family, school, and community contexts. As youth reach adolescence, it is what they think about themselves and others that is a particularly vital aspect of their psychological health and quality of life. In addition to conducting psychometric studies, as a first step to explore the practical applications of the SEHS we have worked with schools to carry out schoolwide screening for complete mental health (e.g., Dowdy et al. 2013). Using the SEHS as a complement to more traditional risk surveys, schools have begun to ask students about their symptoms of mental distress and also about their personal strengths associated with their overall quality of life. For example, in this study the SEHS and the BESS were coadministered and, when used in combination, offered a more balanced and comprehensive perspective on student’s complete mental health functioning, with greater attention to positive development indicators. In addition to the questions being more applicable for all students, the results provided useful information that informed both whole school and individual-level interventions and supports. Using the SEHS in conjunction with a risk-focused assessment allows for the assessment of information about constructs that are related to positive youth development, a practice that is useful and meaningful for schools (see Renshaw et al. in press).

**Study Limitations**

Generalization limitations of the current study’s findings need to be considered as it included a sample of urban Southern California students; however, it did extend support for SEHS structure because the original SEHS sample included students from a moderate-sized rural community. This study’s sample, and that used in its preliminary development (Furlong, You, Renshaw, Smith and O’Malley 2013), both had a majority of students who identified as being of Latino/a heritage. Although there is a need to examine the SEHS factor structure for other groups of students (both other USA sociocultural groups and cross-national groups), we do note that Latinos now comprise a majority of California’s high school population and there is building evidence for the SEHS’s validity for this sizable group of students. Thus far, the samples used in SEHS psychometric studies have included a majority of students whose families have experienced economic disadvantages. Although it is important that the SEHS is showing promise as a valid measure of quality-of-life indicators for these higher-risk and higher-need students, future research is needed that spans across the socioeconomic spectrum. Finally, this study extended the validity of the SEHS by providing evidence of (a) divergent validity (negative related to BESS scores) and predictive validity (early school term covitality was positively related to end-of-term course grades). Nonetheless, future research is needed to examine the relations between the SEHS constructs and other measures of adolescents’ quality of life, particularly ratings provides by others and actual behaviors.

**Conclusion**

School personnel are eager to learn about student functioning in order to help students achieve optimal developmental outcomes. Based on a strong conceptual and empirically-validated model, the SEHS is offered as a complement to traditional risk-based surveillance systems to provide information on psychological building blocks that are positively associated with thriving youth development and predictive of academic achievement. There is now a parsimonious way to measure a variety of constructs associated with positive development, complex models can be tested efficiently, and results can be applied in a way that is useful for schools. Although additional research is needed to further understand covitality, school personnel can now confidently use the SEHS to gather valuable information about student’s social and emotional health.
References
Further Validation of the Social and Emotional Health Survey


373. doi:10.1016/j.jsp.2006.04.004


Table 1
Standardized Factor Loadings for the Covitality Scales from Random Sample 1 (S1).

<table>
<thead>
<tr>
<th>Items and Scales</th>
<th>Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Belief-in-Self</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Self-Efficacy</strong> ^a</td>
<td></td>
</tr>
<tr>
<td>I can work out my problems.</td>
<td>.57</td>
</tr>
<tr>
<td>I can do most things if I try.</td>
<td>.63</td>
</tr>
<tr>
<td>There are many things that I do well.</td>
<td>.62</td>
</tr>
<tr>
<td><strong>Self-Awareness</strong> ^a</td>
<td></td>
</tr>
<tr>
<td>There is a purpose to my life.</td>
<td>.55</td>
</tr>
<tr>
<td>I understand my moods and feelings.</td>
<td>.69</td>
</tr>
<tr>
<td>I understand why I do what I do.</td>
<td>.71</td>
</tr>
<tr>
<td><strong>Persistence</strong> ^a</td>
<td></td>
</tr>
<tr>
<td>When I do not understand something, I ask the teacher again and again until I understand.</td>
<td>.66</td>
</tr>
<tr>
<td>I try to answer all the questions asked in class.</td>
<td>.60</td>
</tr>
<tr>
<td>When I try to solve a math problem, I will not stop until I find a final solution.</td>
<td>.61</td>
</tr>
<tr>
<td><strong>Belief-in-Others</strong></td>
<td></td>
</tr>
<tr>
<td><strong>School Support</strong> ^a (At my school there is a teacher or some other adult who)</td>
<td></td>
</tr>
<tr>
<td>…always wants me to do my best.</td>
<td>.78</td>
</tr>
<tr>
<td>…listens to me when I have something to say.</td>
<td>.72</td>
</tr>
<tr>
<td>…believes that I will be a success.</td>
<td>.84</td>
</tr>
<tr>
<td><strong>Family Coherence</strong> ^a</td>
<td></td>
</tr>
<tr>
<td>My family members really help and support one another.</td>
<td>.78</td>
</tr>
<tr>
<td>There is a feeling of togetherness in my family.</td>
<td>.90</td>
</tr>
<tr>
<td>My family really gets along well with each other.</td>
<td>.81</td>
</tr>
<tr>
<td><strong>Peer Support</strong> ^a (I have a friend my age who)</td>
<td></td>
</tr>
<tr>
<td>…really cares about me.</td>
<td>.77</td>
</tr>
<tr>
<td>…talks with me about my problems.</td>
<td>.90</td>
</tr>
<tr>
<td>…helps me when I’m having a hard time.</td>
<td>.90</td>
</tr>
<tr>
<td><strong>Emotional Competence</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Emotional Regulation</strong> ^a</td>
<td></td>
</tr>
<tr>
<td>I accept responsibility for my actions.</td>
<td>.70</td>
</tr>
<tr>
<td>When I make a mistake I admit it.</td>
<td>.71</td>
</tr>
<tr>
<td>I can deal with being told no.</td>
<td>.54</td>
</tr>
<tr>
<td><strong>Empathy</strong> ^a</td>
<td></td>
</tr>
<tr>
<td>I feel bad when someone gets their feelings hurt.</td>
<td>.56</td>
</tr>
<tr>
<td>I try to understand what other people go through.</td>
<td>.86</td>
</tr>
<tr>
<td>I try to understand how other people feel and think.</td>
<td>.81</td>
</tr>
<tr>
<td><strong>Behavioral Self-Control</strong> ^a</td>
<td></td>
</tr>
<tr>
<td>I can wait for what I want.</td>
<td>.52</td>
</tr>
<tr>
<td>I don’t bother others when they are busy.</td>
<td>.58</td>
</tr>
<tr>
<td>I think before I act.</td>
<td>.58</td>
</tr>
<tr>
<td><strong>Engaged Living</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Gratitude</strong> ^b</td>
<td></td>
</tr>
<tr>
<td>Grateful</td>
<td>.84</td>
</tr>
<tr>
<td>Thankful</td>
<td>.85</td>
</tr>
<tr>
<td>Appreciative</td>
<td>.72</td>
</tr>
</tbody>
</table>
Further Validation of the Social and Emotional Health Survey

Zest<sup>b</sup>
- Energetic .85
- Active .88
- Lively .73

Optimism<sup>a</sup>
- Each day I look forward to having a lot of fun. .74
- I usually expect to have a good day. .82
- Overall, I expect more good things to happen to me than bad things. .69

Note. Response prompt for all items: Please mark the response that shows how true each of these statements is about you.

All values were statistically significant at <i>p</i> < .05. <i>n</i> = 1,120.

<sup>a</sup>Response options: 1 = not at all true of me, 2 = a little true of me, 3 = pretty much true of me, 4 = very much true of me

<sup>b</sup>Response options: 1 = not at all, 2 = very little, 3 = somewhat, 4 = quite a lot, 5 = extremely

Table 2
Model Fit Indices For Invariance Tests For The Second-Order Factor Model

<table>
<thead>
<tr>
<th>Model and invariance level</th>
<th>S-B $\chi^2$</th>
<th>df</th>
<th>SRMR</th>
<th>*RMSEA (CI)</th>
<th>$\Delta$CFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1 (baseline model): Configural invariance</td>
<td>422.44</td>
<td>200</td>
<td>.054</td>
<td>.063 [.055, .071]</td>
<td>—</td>
</tr>
<tr>
<td>Model 2: Full metric invariance</td>
<td>469.47</td>
<td>233</td>
<td>.073</td>
<td>.060 [.052, .068]</td>
<td>.005</td>
</tr>
<tr>
<td>Model 3: Full metric and full scalar invariance</td>
<td>805.86</td>
<td>261</td>
<td>.072</td>
<td>.087 [.080, .093]</td>
<td>.008</td>
</tr>
</tbody>
</table>

Note. S-B $\chi^2$ = Satorra-Bentler scaled chi-square statistic; SRMR = standardized root-mean-square residual.
*RMSAE = robust root-mean-square error of approximation. CI = 90% confidence interval. $\Delta$CFI = difference in robust comparative fit indices between baseline model.

Table 3
Results of Structured Means Analyses with Male Group as the Reference Group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Age 13-15 years</th>
<th>Age 16-18 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Factor intercept (SE)</td>
<td>Effect Size (d)</td>
</tr>
<tr>
<td>Belief-in-Self</td>
<td>-.090 (.035)</td>
<td>-.26*</td>
</tr>
<tr>
<td>Belief-in-Others</td>
<td>.151 (.046)</td>
<td>.38*</td>
</tr>
<tr>
<td>Emotional Competence</td>
<td>.014 (.050)</td>
<td>.03</td>
</tr>
<tr>
<td>Engaged Living</td>
<td>-.084 (.058)</td>
<td>-.14</td>
</tr>
<tr>
<td>CoVitality (highest-order latent trait)</td>
<td>.015 (.035)</td>
<td>.06</td>
</tr>
</tbody>
</table>

Note. The latent mean values for male group were set to zero. *<i>p</i> < .05.
Figure 1. Social and Emotional Health Survey conceptual and measurement model.
Further Validation of the Social and Emotional Health Survey

Figure 2. Social and Emotional Health Survey hierarchal CoVitality (CoVi) model (N = 2,240). BESS = Behavioral Emotional Screening System.