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Validation of the Chinese version of the Social Emotional Health Survey–Primary

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ABSTRACT

The Social Emotional Health Survey–Primary (SEHS-P) was originally developed to assess U.S. elementary students’ positive psychological traits: gratitude, zest, optimism, and persistence, and the higher-order latent construct of covitality. The present study evaluated the validity of a Chinese version of SEHS-P with a sample of 653 Chinese children (Mage = 11.4, SD = 1.0). Confirmatory factor, measurement invariance, and latent means analyses were conducted to evaluate construct validity. Results indicated that the factor structure found for the original U.S. sample was replicated (first-order factors: optimism, gratitude, persistence, zest; second-order factor: covitality). The covitality latent trait was associated with fewer depressive symptoms, higher prosocial behaviors, less victimization and perpetration, and predicted better academic achievement six months later. Implications for using SEHS-P as a social emotional health screening tool for use in Chinese schools are discussed. Future studies should continue to examine SEHS-P in other samples in China as well as in other culture contexts.

KEYWORDS

covitality; social emotional health; elementary school; Chinese children; measurement; positive mental health indicators

For decades, mental health research and services have been predominately conceptualized from a deficit-based perspective originating in the medical service field. While attending to the psychological distress of children is an important component of mental health research and practice, the deficit-based model has the limitation of not capturing a comprehensive balance of human functioning. The World Health Organization’s (WHO, 2014) recently revised definition of mental health is “a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community” (para. 1). This definition stresses the positive dimension of mental health—a broad, balanced array of activities directly or indirectly related to multiple well-being components—and not merely the absence of disease or disorder. Despite recent interest in positive mental health factors, there is a substantial amount of research needed prior to implementing widespread field practices to promote the positive dimensions of mental health. In particular, these efforts include the development of well-validated assessment tools that measure positive mental health indicators.

Unfortunately, widely used mental health screening and assessment tools are now predominantly deficit-focused instruments such as those focusing on risky behaviors (e.g., tobacco use, alcohol and other drug use, sexual risk behaviors, and violence; e.g., Kann et al., 2014). Population-based surveillance surveys that focus on negative indicators of youth development have the benefit of raising awareness among educational and public health policy makers to justify the investment of resources toward prevention and intervention services that promote the health of high-risk children and adolescents (Kann et al., 2014). However, data from surveillance surveys alone do not provide information about the life conditions and experiences of the majority of youth, who report limited involvement in risky behaviors or rarely evidence symptoms of psychological disorders (You et al., 2014). These surveys also do not capture and evaluate the positive youth development indicators (e.g., gratitude) that are known to be associated with students’ well-being and overall quality of life for all students (Huebner, Antaramian, & Heffner, 2012), which includes students being fruitfully and productively engaged in their school work and school life.

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Social Emotional Health Survey (SEHS) and covitality

To provide a more comprehensive picture of youth mental health, researchers who take a positive youth development perspective have begun to develop and validate various strength-based assessment tools. One recently developed instrument—the Social Emotional Health Survey (SEHS)—reflects the advanced understanding of youth social-emotional well-being (Furlong et al., 2014). Specifically, the SEHS was designed to measure not only isolated, individual social-emotional constructs, but also a multidimensional, higher-order construct of covitality, which includes a range of social and emotional psychological dispositions that are hypothesized to be associated with positive youth development (Renshaw et al., 2014). As a counterpart of “comorbidity,” which has been used commonly in psychology, the metaconstruct “covitality” is defined as the “synergistic effect of positive mental health resulting from the interplay among multiple positive psychological building blocks” (Renshaw et al., 2014, p. 14). The covitality concept represents the observation that positive traits tend to co-occur in individuals; that is, these positive cognitive mindsets or schemas congeal in tandem and interactively. Weiss and Luciano (2015) discussed the theoretical and empirical foundations of covitality in the areas of genetics, evolution, and personality, which supported the proposition that covitality can be considered universal (similar across cultures). To test the universality of this proposition, researchers need to examine the measurement invariance of the SEHS in different cultures (Furlong, Ritchey, & O’Brien, 2009). The Secondary version of SEHS (SEHS-S) has been validated with samples of high school students from the United States (Furlong et al., 2014; You, Furlong, Felix, & O’Malley, 2015), Korea (Lee, You, & Furlong, 2015), Japan (Ito, Smith, You, Shimoda, & Furlong, 2015), and Turkey (Telef & Furlong, 2016). Drawing on a sample of more than 14,000 California students, You et al. (2014) found support for the full measurement invariance of the SEHS-S hypothesized higher-order covitality latent trait for five groups of diverse high school students in the U.S. State of California (including Latino/a, White, multiracial, Black, and Asian). Cross-national research has also replicated the higher-order covitality construct, and found covitality positively correlated with academic performance and social relationships of Japanese students (Ito et al., 2015). Covitality also positively correlated with subjective well-being and school achievement, and negatively correlated with externalized and internalized symptoms of Korean students (Lee et al., 2015).

Social Emotional Health Survey-Primary research

Compared to SEHS-S, SEHS-Primary version (SEHS-P; originally named Positive Experiences at School Scale; Furlong, You, Renshaw, O’Malley, & Rebelez, 2013) is much less studied. SEHS-P is a brief, self-report, developmentally appropriate assessment for elementary school students. This scale is comprised of subscales measuring four school-anchored positive-psychological traits: gratitude, zest, optimism, and persistence, all of which previous research has demonstrated to be associated with youth well-being, life satisfaction, academic achievement, and school engagement (see Furlong et al. [2013] for a review). SEHS-P has been used as a universal school mental health screening tool in combination with deficit-based symptom measures to identify students who report low covitality (these students are not always identified with deficit-focused screening tools alone) and who report high psychological distress symptoms (Kim, Dowdy, & Furlong, 2014). Furlong and colleagues (2013) found that the second-order covitality latent trait was associated with increased reports of feeling safe at school, whereas lower covitality scores were associated with increased reports of being bullied at school. Furlong and colleagues also added another component, “prosocial behavior,” into the SEHS-P. The SEHS-P has recently been validated in the Turkish culture, and covitality was found to correlate with school satisfaction and positive experiences (Telef, 2016). Although Liu and colleagues (Liu, Han, Li, Wang, & Xiao, 2016) recently validated SEHS-P among Chinese elementary students, they did not use the final version of SEHS-P. In general, the validation of the SEHS-P in different cultural groups is still limited (Furlong et al., 2013). To fill in this gap, the present study examined the reliability and the construct, concurrent, and predictive validities of the SEHS-P in a sample of elementary school students in a nonurban setting (i.e., a small town) in Mainland China. To assist readers to better understand the potential contributions of this study, in the following section we briefly review the social-emotional and mental health needs of Chinese students and the status of strength-based measurement research in China.

Social-emotional and mental health needs of Chinese students

China has 238 million children under age 15 (National Bureau of Statistics of China, 2010). Results from a nationwide epidemiological study indicated there has been an increasing trend in the overall prevalence of mental health disorders among youth in China and that
15% of Chinese children experienced mental health problems (see Zhao & Zheng, 2014 for a review). Societal changes in China, particularly its rapid economic development and social reforms, have had a great influence on children’s schooling experience and mental health. For instance, a highly competitive education system, high expectations for children from one-child families, and a weakened traditional social support system for the “left-behind” children in rural areas (when parents go to work in large cities and leave their children to the care of grandparents or other extended families) have greatly increased stress among Chinese school-aged children (Hesketh, Ding, & Jenkins, 2002; Li, 2009). Unfortunately, most students who are at risk of developing mental health problems have very limited access to professional psychological help due to the scarcity of qualified mental health service providers and pathways to care (Hesketh et al., 2002; Zheng & Zheng, 2015). To address the increasingly serious mental health needs among school-aged children, the Ministry of Education in Mainland China has taken initial efforts to implement “mental health education” in schools and mandated the hire of at least one part-time or full-time school psychological services provider (SPs) in each school (Ministry of Education, 2012). Research has shown that for SPs in Chinese schools, their roles mainly focus on services for students (including teaching mental health classes, counseling, and teacher consultation), with a strong emphasis on prevention and early intervention services (Wang, Ni, Ding, & Yi, 2015).

SPs in China face many barriers to promote mental health among children in schools, including, but not limited to, a lack of professional psychological training and low status at school. Specifically, due to the severe shortage of degree training programs in psychology in China (i.e., only 82 universities in China offered degree programs in psychology in 2013), the trainings and requirements of SPs in China are not as systematic, structured, and specialized as school psychologists’ in the United States and none of the Chinese psychology programs implement the accreditation and professional training standards of the International School Psychology Association (ISPA, 2016). One study showed that many SPs were general education teachers who received some additional training related to psychology, and only one third of them were certified as mental health counselors or had degrees in psychology (Wang, Ni, et al., 2015). Another challenge is the lack of well-validated population-based measurements or screening tools to assess and monitor students’ mental health status. Though one study has examined the utility of an integrated well-being measure (e.g., the Children and Adolescent Wellness Scale, CAWS) in Asian countries (Japan, Korea, Taiwan, and Thailand; Asamsama et al., 2014), due to sampling and methodology limitations, it is still unclear if the CAWS measure is suitable as a screening tool for the mental health and wellness status of youths from collectivist cultures, such as the Chinese culture. Among the measurements that have been used in large-scale studies on the mental health of Chinese children and adolescents, most are deficit-grounded measurements imported from Western countries. There are few strength-based screening measurements in China, and most measures were introduced, translated, validated, and adapted based from Western measurements (for more information, see Tian et al., 2014). Most of the measures focus on individual positive constructs, such as life satisfaction (Tian & Liu, 2005) and gratitude (Hou & Zhang, 2009). There is a limited number of well-validated measurements that assess a variety of indicators of positive youth development in an integrated conceptual model. Even more limited are validated strengths-based measurements among elementary children in China. In addition, thus far most studies were conducted in large cities in China (e.g., He et al., 2015; Tian & Liu, 2005), and there is limited research among Chinese children in nonurban areas (e.g., rural areas, small towns) who face unique challenges, such as lower socioeconomic circumstances and less access to social resources. The current study aimed to fill in these gaps in the literature for elementary school-aged children in a nonurban area in China by examining evidence for the validity of an established strengths-based measure, SEHS-P, which measures covitality based on an integrated conceptual model.

Current study

Validating SEHS-P in a Chinese sample is a first step to provide Chinese educators and school psychologists a useful tool for social emotional screening to promote mental health among Chinese children. Therefore, the main goals of this study were to (a) provide a preliminary examination of the construct, concurrent, and predictive validities and reliability of the Chinese version of the SEHS-P, and (b) examine latent mean differences across gender. Given the consistent support of the SEHS-S measurement model in different cultural groups (e.g., Lee et al., 2015; You et al., 2015), we hypothesized that:

1. The Chinese version of SEHS-P based on the Chinese sample would be best supported by a second-order structure with one second-order
factor (i.e., covitality) and four first-order factors (i.e., gratitude, optimism, zest, and persistence), matching the SEHS-P factor structure reported for U.S. samples (Furlong et al., 2013).

(2) The factor structure of the second-order model would be statistically equivalent across gender at configural, factor loading, and intercept levels.

(3) The first-order constructs as well as the second-order latent factor of “covitality” would have significantly positive correlations with positive developmental indicators (e.g., prosocial behaviors and academic achievement) and negative correlations with undesirable development indicators (e.g., depression, bullying perpetration, victimization).

Method

Participants

The participants were 662 children in Grades 4–6 attending one elementary school in a town near Ningbo, Zhejiang Province in eastern China. After initial data screening, nine cases were removed due to missing data (e.g., gender). The final sample included 653 participants, which was balanced across grades (28.6% fourth graders, 35.4% fifth graders, and 36.0% sixth graders) and gender (51.1% females, 49.9% males). The students were all between the ages of 9 and 14 years (M = 11.4, SD = 1.0). As reported by the school principal, most students in the school were from working-class families. The average annual income for residents in the district was 26,682 yuan ($4,055) in 2014 (Ningbo Government, 2015), which was lower than the average income of 40,393 yuan ($6,138) in the Zhejiang province, and the average income of 28,844 yuan ($4,383) in China (Sina, 2015).

Procedures

SEHS-P was translated into Chinese by one researcher and independently back-translated into English by another researcher. Both researchers are fluent in both English and Chinese. Modification in translation was made after consulting with the original author of the SEHS-P to ensure the Chinese version captured the essence of SEHS-P. Further, two elementary school language teachers from China reviewed the Chinese version to evaluate its readability for elementary school students in China; they confirmed the readability and no modification was made. See the SEHS-P specific items in Chinese in the online Supplemental Material.

Institutional review board (IRB) approval was obtained prior to data collection. One principal from one elementary school in a town in Zhejiang province agreed to participate in this study. Therefore, the students in this school were recruited. A passive consent procedure was used. Specifically, the parents of all children in Grades 4–6 were notified about this research, made aware of the risks and benefits associated with their children’s participation, and given the option to refuse participation. No rejections from parents were received. As a result, all students in Grades 4–6 who were present during the time of data collection participated in the survey. Data were collected through an online survey during the students’ regular computer class in the computer lab at the school. School personnel used a script prepared by the first author to assist students in filling out the survey. At the beginning of the data collection session, students were informed that (a) the survey was confidential, (b) their participation was voluntary, and (c) they could exit the survey at any point if they wanted to discontinue. Then students indicated their willingness to participate in the project by signing the electronic assent form. Students were reminded to complete each item automatically by the online survey software in order to reduce missing data.

Six months later, final exam grades for Chinese, English, and math were retrieved from the school records for 621 students who participated in the initial survey as an evidence for their academic achievement. The final grades were on a scale from 0 to 100 for each subject area (Chinese, English, and math) with 100 meaning 100% correct, which is the typical grading method in Chinese schools.

Measures

The Social and Emotional Health Survey–Primary (SEHS-P; Furlong et al., 2013) assesses core psychosocial strengths based on a second-order model that consists of four lower-order positive psychology traits measured by four subscales, including gratitude (e.g., “I am lucky to go to my school”), optimism (“When I have problems at school, I know they will get better in the future”), zest (“I wake up in the morning excited to go to school”), and persistence (e.g., “When I get a bad grade, I try even harder the next time”) (see Table 1 for the specific items). In addition, SEHS-P includes another subscale that measures students’ prosocial behavior at school (e.g., “I follow the classroom rules”), which is not part of the covitality construct. Students were asked to rate 20 items on a 4-point scale,
ranging from 1 = never, 2 = sometimes, 3 = often, and 4 = very often. This instrument has been validated in a sample of U.S. elementary school students, and results supported its second-order measurement model of covitality, reliability (.66 to .80 for subscales and .88 for the second order covitality factor), and concurrent validity (e.g., covitality correlated with feelings of school safety, bullying, and prosocial behavior; Furlong et al., 2013).

The Verbal and Physical Bullying Scale–Victimization (VPBS-V; Swearer, Turner, Givens, & Pollack, 2008) is an 11-item scale that assesses both verbal or relational (7 items, e.g., “made fun of me”) and physical victimization (4 items, e.g., “pushed or shoved me”). All items are scored on a 5-point scale (1 = never happened to 5 = always happened) with higher scores indicating more frequent peer victimization. Two previous studies have demonstrated a two-factor structure (physical victimization and verbal or relational victimization) of this measure and high internal consistency (α = .79 – .87; Radliff, Wang, & Swearer, 2016; Swearer et al., 2008). The measure has been validated in a Chinese sample, and showed a high internal consistency α of .64, .75, and .82 for physical, verbal or relational, and total victimization, respectively (Wang, Li, & Atwal, 2015). The internal consistency reliability α was .71, .80, and .86 for physical, verbal or relational, and total victimization in this study.

Table 1. Confirmatory Factor Analysis of the SEHS–P: Second-order model.

<table>
<thead>
<tr>
<th>Item</th>
<th>Sample 1</th>
<th>Sample 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Loading</td>
<td>SE</td>
</tr>
<tr>
<td>Second-order Factor: Covitality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gratitude</td>
<td>.89</td>
<td>.03</td>
</tr>
<tr>
<td>Optimism</td>
<td>.83</td>
<td>.04</td>
</tr>
<tr>
<td>Zest</td>
<td>.94</td>
<td>.03</td>
</tr>
<tr>
<td>Persistence</td>
<td>.77</td>
<td>.04</td>
</tr>
<tr>
<td>First-order Factor 1: Gratitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. I am lucky to go to my school.</td>
<td>.74</td>
<td>.03</td>
</tr>
<tr>
<td>2. I am thankful that I get to learn new things at school.</td>
<td>.87</td>
<td>.02</td>
</tr>
<tr>
<td>3. We are lucky to have nice teacher at my school.</td>
<td>.84</td>
<td>.02</td>
</tr>
<tr>
<td>4. I feel thankful for my good friends at school.</td>
<td>.64</td>
<td>.04</td>
</tr>
<tr>
<td>First-order Factor 2: Optimism</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. When I have problems at school, I know they will get better in the future.</td>
<td>.64</td>
<td>.05</td>
</tr>
<tr>
<td>6. I expect good things to happen at my school.</td>
<td>.75</td>
<td>.03</td>
</tr>
<tr>
<td>7. Each week, I expect to feel happy in class.</td>
<td>.79</td>
<td>.04</td>
</tr>
<tr>
<td>8. I expect to have fun with my friends at school.</td>
<td>.80</td>
<td>.04</td>
</tr>
<tr>
<td>First-order Factor 3: Zest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. I get excited when I learn something new at school.</td>
<td>.78</td>
<td>.04</td>
</tr>
<tr>
<td>10. I get really excited about my school projects.</td>
<td>.68</td>
<td>.04</td>
</tr>
<tr>
<td>11. I wake up in the morning excited to go to school.</td>
<td>.71</td>
<td>.05</td>
</tr>
<tr>
<td>12. I get excited when I am doing my class assignments.</td>
<td>.69</td>
<td>.05</td>
</tr>
<tr>
<td>First-order Factor 4: Persistence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. I finish all my class assignments.</td>
<td>.68</td>
<td>.04</td>
</tr>
<tr>
<td>14. When I get a bad (low) grade, I try even harder the next time.</td>
<td>.79</td>
<td>.03</td>
</tr>
<tr>
<td>15. I keep working until I get my schoolwork right.</td>
<td>.71</td>
<td>.04</td>
</tr>
<tr>
<td>16. I do my class assignments even when they are really hard for me.</td>
<td>.81</td>
<td>.03</td>
</tr>
</tbody>
</table>

Note. Loading = standardized factor loading; SE = standard error; z = robust z score.
with related subscales (depression–anxiety subscale, internalizing problems) in the CBCL-P Chinese version (Su et al., 2003). The internal consistency was .78 in the current study.

Data analyses

The analyses were conducted in four stages. The first two stages of analysis were conducted in Mplus 7.31 (Muthén & Muthén, 1998–2015) utilizing the full information maximum likelihood (FIML) estimator. In the first stage, confirmatory factor analysis (CFA) was conducted to determine the final model for the SEHS-P. According to Thompson (2004), CFA is considered the method of choice when the factorial structure of a scale is hypothesized. A hypothesized second-order factor model was first tested; three alternative models—a one-factor model, a four-factor model, and a bifactor model—were then estimated and compared with the hypothesized second-order factor model. During the analysis in the first stage, the sample was randomly divided into two subsamples for cross-validation purposes. One half of the sample was used to analyze and compare model fit for the hypothesized model and the three alternative models. The final model from those analyses was then replicated using the second half of the sample.

When evaluating the hypothesized and alternative models, model fit was assessed using Satorra–Bentler (S-B) scaled chi-square values, Akaike Information Criterion (AIC) values, and three other fit indices: the Comparative Fit Index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). The model fit is considered acceptable when CFI ≥ .90, RMSEA ≤ .08, and SRMR ≤ .08 (Hu & Bentler, 1998; 1999).

The second-order model was selected as the final model from the first stage. In the second stage, we followed the five-step procedure suggested by Chen and colleagues to test measurement invariance across gender in the final model by comparing five increasingly restrictive models in a hierarchical sequence (Chen, Sousa, & West, 2005). Each pair of models in the sequence is nested because a set of parameters are constrained to be equal across groups in the more restricted model. To compare the fit for two nested models, Satorra–Bentler scaled chi-square difference (Asparouhov & Muthén, 2010) and the goodness-of-fit indexes (Cheung & Rensvold, 2002) are used. However, because the performance of the chi-square difference test is also affected by nonnormality and large sample size, we followed the recommendation by Cheung and Rensvold (2002) and considered a difference of larger than .01 in the change of CFI as an indication of a meaningful change in model fit for testing measurement invariance.

If the measurement invariance across gender is supported in the second stage, we then move to the third stage to examine latent mean differences. The male group was chosen as a reference or baseline group and its latent mean was set to zero. The latent mean of the female group was freely estimated and its values reflect latent mean differences of the two groups. Statistical significance associated with latent mean differences was determined using the z-statistic (Aiken, Stein, & Bentler, 1994). Effect sizes and confidence intervals associated with the latent mean differences were estimated according to the guidelines of Hancock (2001). In the fourth stage, additional analyses were conducted in SPSS (version 22) to examine the correlations among factors, to calculate the internal consistency of the factor scores and total score, and to examine the validity of SEHS-P.

Results

Stage 1: Confirmatory factor analysis (CFA)

CFA results for the hypothesized model (i.e., second-order model) and three alternative models (i.e., one-factor model, four-factor model, and bifactor model) with the first randomly selected half of the sample are summarized in Table 2. The hypothesized second-order model and four-factor model yielded adequate fit indices, whereas the one-factor model, the most parsimonious of the three alternative models, yielded poor fit statistics. The bifactor model failed to converge. When the four-factor model and the nested one-factor model were compared, the Satorra–Bentler scaled chi-square difference, ΔS-Bχ² = 170.59 (Δ df = 6), p < .001, indicated that the four-factor model had a significantly better fit than the one-factor model. When the four-factor model was compared to the proposed nested second-order model, the ΔS-Bχ² = 0.88 (Δ df = 2), ns indicated that there was no significant difference on model fit between the four-factor model and the second-order model. The second-order model achieved better model fit than the four-factor model based on the model fit indices. Moreover, the second-order model is more parsimonious and is more consistent with both the theories of covitality (Weiss & Luciano, 2015) and the factor structure of SEHS-P.

Table 2. Fit statistics for models tested.

<table>
<thead>
<tr>
<th>Model</th>
<th>χ²</th>
<th>df</th>
<th>CFI</th>
<th>SRMR</th>
<th>RMSEA 90% [CI]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second-order model</td>
<td>220.77*</td>
<td>100</td>
<td>.939</td>
<td>.049</td>
<td>.061 [.050, .072]</td>
</tr>
<tr>
<td>One-factor model</td>
<td>471.97*</td>
<td>104</td>
<td>.813</td>
<td>.070</td>
<td>.104 [.095, .114]</td>
</tr>
<tr>
<td>Four-factor model</td>
<td>221.71*</td>
<td>98</td>
<td>.937</td>
<td>.049</td>
<td>.062 [.051, .073]</td>
</tr>
</tbody>
</table>

Note. Models were tested on one randomly selected half of sample (n = 329). *p < .001.
supported by a previous study in the United States (Furlong et al., 2013), thus the second-order model with one higher-order factor (i.e., covitality) and four lower-order factors (i.e., gratitude, optimism, zest, and persistence) was chosen as the final model in the present study.

Robust support for the second-order model also was found when the CFA was replicated with the second randomly selected half of the sample, $\chi^2 = 207.17$ ($df = 100, \ n = 327$), $p < .001$; CFI = .944, RMSEA = .057, 90% CI = [.046, .068], and SRMR = .055. Items generally had similar standardized factor loadings in the two halves of the sample (see Table 3). Because no appreciable differences in the fit indices or factor loadings were found, all subsequent analyses were run with the full sample. The standardized factor loadings for the second-order model with full sample size are illustrated in Figure 1. Fit statistics for the second-order model in the full sample and subgroups with different gender (i.e., male and female) are summarized in Table 1.

### Stage 2: Measurement invariance test

Following the procedure described previously, measurement invariance of the second-order model was tested in a hierarchical sequence with five increasingly restrictive steps to examine whether the factor structure of the second-order model is statistically equivalent across male and female students. The results are discussed below (see Table 4).

#### Configural invariance (Model 1)

Configural invariance examines if the same items were indicators of the same latent factor. In testing for configural invariance, the same parameters in the second-order model were estimated across male and female groups, but different

---

**Table 3.** Fit statistics between groups for the second-order model.

<table>
<thead>
<tr>
<th>Model</th>
<th>N</th>
<th>$\chi^2$</th>
<th>df</th>
<th>CFI</th>
<th>SRMR</th>
<th>RMSEA</th>
<th>90% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full sample</td>
<td>653</td>
<td>348.02*</td>
<td>100</td>
<td>.933</td>
<td>.051</td>
<td>.062</td>
<td>[.055, .069]</td>
</tr>
<tr>
<td>Male</td>
<td>327</td>
<td>250.50*</td>
<td>100</td>
<td>.921</td>
<td>.057</td>
<td>.068</td>
<td>[.057, .078]</td>
</tr>
<tr>
<td>Female</td>
<td>326</td>
<td>211.92*</td>
<td>100</td>
<td>.940</td>
<td>.052</td>
<td>.059</td>
<td>[.046, .067]</td>
</tr>
</tbody>
</table>

*Note.* $*p < .001.$
estimates were allowed for the corresponding parameters in the different groups. The fit of configural invariance models also provided the baseline value against which all subsequently specified invariance models were compared (Byrne, 2006). As shown in Table 4, the model testing configural invariance (Model 1) across gender had adequate fit, $\chi^2 = 463.46$ ($df = 200$), $p < .001$; SRMR = .054; RMSEA = .054, 90% CI = [.056, .071]; CFI = .930.

### Invariance of first-order factor loadings (Model 2)

In testing for first-order factorial invariance, all of the first-order factor loadings were constrained to be equal across groups. This level of invariance was nested within Model 1. Comparing Model 1 and Model 2 across gender, the chi-square difference test was not significant, $\Delta \chi^2 = 14.01$ ($\Delta df = 12$), ns, and $\Delta$CFI was less than .01. These results indicated that the first-order factor loadings were invariant across male and female students.

### Invariance of first- and second-order factor loadings (Model 3)

In testing for first- and second-order factorial invariance, all first- and second-order factor loadings were constrained to be equal across groups. This form of invariance was nested within Model 2. Comparing Model 2 and Model 3 across gender, the chi-square difference test was not significant, $\Delta S-B \chi^2 = 3.13$ ($\Delta df = 3$), ns, and $\Delta$CFI was less than .01, suggesting first- and second-order factor loadings invariance between male and female students.

### Invariance of first- and second-order factor loading and intercepts of measured variables (Model 4)

In addition to the constraints already imposed on the first- and second-order factor loadings in Model 3, the intercepts of the measured variables were constrained to be equal across groups. This condition is required to detect potential differences in the intercepts of the measured variables between groups when only the first-order factors are involved. Comparing Model 3 and Model 4 across gender, the chi-square difference test was not significant, $\Delta S-B \chi^2 = 13.51$ ($\Delta df = 12$), ns, and $\Delta$CFI was less than .01, indicating measurement invariance of first- and second-order factor loading and intercepts of measured variables across male and female students.

### Invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors (Model 5)

In the second-order factor model, the intercepts of the first-order latent factors must also be invariant across groups in addition to intercept invariance of measured variables to compare the second-order factor means across groups. In testing for this level of invariance, first- and second-order factor loadings and the intercepts of the measured variables and first-order latent factors were constrained to be equal across groups. Comparing Model 4 and Model 5 across gender, the chi-square difference test was not significant, $\Delta S-B \chi^2 = 3.24$ ($\Delta df = 3$), ns, and $\Delta$CFI was less than .01, indicating scalar invariance across the male and female groups.

### Stage 3: Test of the gender difference in latent means of the first-order and second-order factors

When differences in latent means were compared, there was no significant gender difference in latent means for both the second-order factor Covitality ($-0.02, z = -0.32, p = ns$) and the four first-order factors: Gratitude (0.01, $z = 0.14, p = ns$), Optimism ($-0.03, z = 0.14, p = ns$), Zest ($-0.05, z = -0.85, p = ns$), and Persistence (0.03, $z = 0.54, p = ns$). As shown in Table 5, the effect sizes of the latent mean differences were in the small range.

### Stage 4: Reliability and validity analyses of SEHS-P

#### Table 5. Observed means and differences in latent means of first-order and second-order factors.

<table>
<thead>
<tr>
<th>Latent mean and differences</th>
<th>Observed means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
</tr>
<tr>
<td>$M_{\text{Female}} - M_{\text{Male}}$</td>
<td>Estimates</td>
</tr>
<tr>
<td>Covitality</td>
<td>$-0.02$</td>
</tr>
<tr>
<td>Gratitude</td>
<td>$0.01$</td>
</tr>
<tr>
<td>Optimism</td>
<td>$-0.03$</td>
</tr>
<tr>
<td>Zest</td>
<td>$-0.05$</td>
</tr>
<tr>
<td>Persistence</td>
<td>$0.03$</td>
</tr>
</tbody>
</table>
Table 6. Internal consistency coefficients (in diagonal) and correlational coefficients between subscale and total scale scores for the full sample.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Gratitude</td>
<td>.84</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Optimism</td>
<td>.65</td>
<td>.80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Zest</td>
<td>.73</td>
<td>.64</td>
<td>.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Persistence</td>
<td>.58</td>
<td>.55</td>
<td>.58</td>
<td>.83</td>
<td></td>
</tr>
<tr>
<td>5. Covitality</td>
<td>.88</td>
<td>.84</td>
<td>.88</td>
<td>.79</td>
<td>.93</td>
</tr>
</tbody>
</table>

Correlations among the subscales and the full scale of SEHS-P were computed to examine their relative independence and the degree to which they assessed the covitality construct. Manifest indicators of each factor (i.e., sum of raw scores of items on the derived subscales and total scale) were used for subsequent analyses. Moderate to strong correlations across subscales were found, with coefficients ranging from .55 to .88. The SEHS-P subscales were found to be reliable with internal consistency coefficients ranging from .82 to .93 (Table 6).

The concurrent validity of the SEHS-P-Chinese version was examined. Results indicated that covitality had significant and large correlation (all $p < .001$) with self-reported prosocial behavior at school ($r = .65$), significant and moderate correlation with depressive symptoms ($r = -.32$), and significant and small correlation with verbal or relational victimization ($r = -.17$), physical victimization ($r = -.15$), total victimization ($r = -.18$), verbal or relational perpetration, physical perpetration, and total perpetration (all $rs = -.25$). In addition, covitality was significantly and positively (all $ps < .001$) related to students’ final exam grades six months later, including Chinese ($r = .13$), math ($r = .18$), and English ($r = .18$). Although most of the correlations were in the small range, they were all significant as expected (Table 7).

Discussion

There are several strengths of this study. First, this study is the first to validate the Chinese version of SEHS-P in China as well as in a nonurban sample.

Table 7. Mean, SD, and correlation among variables of interest.

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>Correlation with covitality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese grades</td>
<td>88.42</td>
<td>6.74</td>
<td>.13*</td>
</tr>
<tr>
<td>Math grades</td>
<td>82.60</td>
<td>14.29</td>
<td>.18*</td>
</tr>
<tr>
<td>English grades</td>
<td>87.51</td>
<td>9.59</td>
<td>.18*</td>
</tr>
<tr>
<td>Prosocial behavior</td>
<td>13.73</td>
<td>2.36</td>
<td>.65*</td>
</tr>
<tr>
<td>Victimization total</td>
<td>1.81</td>
<td>0.64</td>
<td>-.18</td>
</tr>
<tr>
<td>Perpetration total</td>
<td>1.46</td>
<td>0.58</td>
<td>-.25*</td>
</tr>
<tr>
<td>Physical victimization</td>
<td>1.78</td>
<td>0.70</td>
<td>-.15*</td>
</tr>
<tr>
<td>Verbal victimization</td>
<td>1.82</td>
<td>0.68</td>
<td>-.17*</td>
</tr>
<tr>
<td>Physical bullying</td>
<td>1.44</td>
<td>0.62</td>
<td>-.25*</td>
</tr>
<tr>
<td>Verbal bullying</td>
<td>1.45</td>
<td>0.58</td>
<td>-.25*</td>
</tr>
<tr>
<td>Depression</td>
<td>1.56</td>
<td>0.29</td>
<td>-.32*</td>
</tr>
<tr>
<td>Covitality</td>
<td>49.94</td>
<td>9.77</td>
<td></td>
</tr>
</tbody>
</table>

Note. * $p < .001$.

Researchers have suggested the need to examine the influence of covitality on students’ academic performance in underrepresented populations (Rand, 2009). However, most research on positive psychology constructs has been conducted in Western countries (e.g., Furlong et al., 2013; Huebner et al., 2012), and much less in Eastern countries. Among the few research studies in China, most of them were conducted in large cities (e.g., He et al., 2015; Tian & Liu, 2005). As a result, the understanding of positive development in children living in nonurban areas in China is limited. Based on the data from National Bureau of Statistics of China (2010), 38% of the Chinese population lives in urban areas, 24% lives in towns, and 38% lives in rural areas. This study contributes to the literature by using a sample that represents an understudied population. Our results support the generalizability of the covitality constructs in children living in less economically advanced areas (e.g., small towns) in China. Second, we applied a wide range of important developmental outcomes in school-aged children in order to investigate the validity of the SEHS-P. Particularly, the longitudinal data of academic grades strengthened the conclusion on the predictive validity of covitality.

Our results provided initial validation evidence of the SEHS-P with a Chinese sample and provided support for its reliability and validity. These results support further research into the use of the SEHS-P as a screening tool for social-emotional health among elementary school students in China. Covitality could be an indicator for students’ overall social-emotional health, as it was significantly associated with better academic achievement, more prosocial behaviors, fewer internalizing symptoms, and fewer peer relationship problems (victimization and bullying perpetration) in this Chinese sample.

In addition, multigroup invariance analysis indicated that the second-order measurement model fit equally well for both boys and girls. No gender differences were observed for latent mean scores in covitality, gratitude, zest, persistence, and optimism in this Chinese elementary sample. This result was somewhat different from a previous study in the United States that showed higher scores in girls than boys on total covitality, gratitude, zest, and persistence but not optimism (Furlong et al., 2013). To better understand the different gender effect on these constructs in the Chinese cultural context, we compared our findings to a very limited number of Chinese studies on individual positive psychology constructs, such as gratitude, persistence, and passion/zest. These studies mainly focused on adolescents and showed mixed results (Hou & Zhang, 2009; Wen, Zhang, Li, Yu, & Dai, 2010; Zhang, Liu, & Zheng,
For example, some studies found that middle-school girls reported higher gratitude (Wen et al., 2010) and persistence (Zhang et al., 2007) than boys. However, other studies using middle-school students did not find gender differences in persistence (He, Hui, & Liu, 2013) or passion/zest (Zhang et al., 2007). Additionally, one study using preschoolers in China did not find gender differences in persistence (He et al., 2015). Though far from conclusive, it is possible that age or developmental level plays a role in students’ self-evaluated positive traits in the Chinese cultural context. Specifically, compared to Western cultures, Chinese culture places more emphasis on conformity at home and school from a young age, regardless of children’s gender. Before the gender differences in all bio-social-psychological aspects emerge as youth reach adolescence, Chinese boys’ and girls’ self-evaluation is likely more similar rather than different. Other factors such as grade level and type of school (e.g., top schools with higher competition and higher academic achievement among students) may also influence Chinese students’ persistence, passion/zest, and optimism (Zhang et al., 2007). Some researchers also suggested that gratitude is one of the highly valued virtues in human beings and is a stable dimension or facet of human temperament and personality, for both males and females. Therefore, there should be no gender differences in gratitude (He et al., 2013). Due to the inconsistency in the literature, future studies are needed to continue exploring the potential gender and age differences in covitality factors among Chinese children.

**Limitations and future studies**

In spite of the strengths, this study has several limitations. First, data were only collected from one school in China, and the average income for the residents in the district was slightly below the national average. Whether the results can be generalized to schools in other areas in China with different demographics (e.g., economic circumstances) is unclear. Readers should be cautious when comparing the results from this study to other populations in China. Future studies should continue to examine SEHS-P in other samples in China as well as in other culture contexts. Second, when the four-factor model was compared to the second-order model, the results indicated that there was no significant difference on model fit. The second-order model was selected as the preferred model because it was more parsimonious and was more consistent with the theory. More evidence is needed to continue support the higher-order covitality latent trait in SEHS-P. Third, the correlations between covitality and grades were small, and should be interpreted with caution.

**Implication for practice in Chinese schools**

Considering the increase in the overall prevalence of child mental health problems in China and the extremely limited access to professional mental health services, the Ministry of Education in Mainland China has taken efforts in implementing mental health education to students by hiring school psychological service providers (SPs) in schools. Previous research has shown that the main role for SPs is providing services for all students with a focus on primary prevention, including teaching psychoeducational classes, counseling students, consultation with teachers, and conducting schoolwide screenings (Wang, Ni, et al., 2015). However, psychometrically sound and empirically validated screening tools incorporating positive psychology constructs in Chinese are rare. The validity of SEHS-P, especially its prediction of later academic achievements, can be particularly useful to facilitate stakeholders’ (e.g., principals) buy-in of the idea of covitality and complete mental health in the Chinese educational context. SPs may use SEHS-P to identify students with low covitality and subsequently provide specific prevention and early intervention, as previous studies have shown that using strength-based tools is related to better student outcomes (Cox, 2006). Furthermore, guided by a dual-factor mental health model (Suldo & Shaffer, 2008; Suldo, Thalji, & Ferron, 2011), SPs may consider using both strengths-based measures (e.g., SEHS-P) and deficit-based measures (e.g., the Depression Self-Rating Scale for Children) to identify students who score low on covitality (who would not normally be identified using deficit-focused screening tools) and who score high on psychological symptoms for additional interventions (see, for example, Kim et al., 2014).

It is worthwhile to note that implementation of schoolwide social-emotional learning curriculums has been found to relate to better academic achievement among students in the United States (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). Different from the United States, psychoeducational classes are mandatory in Chinese schools and most SPs teach psychoeducational classes at school (Wang, Ni, et al., 2015). Because there are limited evidence-based social-emotional learning curriculums in China, most SPs use curriculums developed by themselves or by the school district. SPs could use SEHS-P as a progress monitoring tool before and after implementing psychoeducational lessons focusing on covitality constructs (e.g., gratitude, zest, and persistence). The progress monitoring
data could provide evidence to evaluate and demonstrate the impact of SPs’ service. This could be particularly important for practical reasons because the two major and related challenges SPs face in China are (a) difficulties demonstrating the effectiveness of their work and (b) a lack of support from school administrators (Wang, Ni, et al., 2015). Although more empirical work is needed to develop culturally grounded interventions to target covi-
tality in China, the validation of SEHS-P is clearly the first step toward the greater goal of promoting social and emotional health for Chinese children.

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