Child Ind Res (2018) 11:507–521
DOI 10.1007/s12187-017-9444-0

Student Subjective Wellbeing as a Predictor of Adolescent Problem Behaviors: a Comparison of First-Order and Second-Order Factor Effects

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Accepted: 5 January 2017 / Published online: 12 January 2017

Abstract The present study investigated the predictive validity of two competing measurement models underlying the Student Subjective Wellbeing Questionnaire (SSWQ)—first-order and second-order—relative to several specific classes of adolescent problem behaviors: antisocial behavior, alcohol use, tobacco use, suicidal tendencies, nutrition habits, and school dropout. Analyses conducted with a sample or urban high-school students in Turkey (Grades 9–12, $N = 374$) demonstrated that the SSWQ's first-order measurement model, which consisted of four fully-correlated factors (i.e., joy of learning, school connectedness, academic efficacy, and educational purpose), and second-order measurement model, which structured these four first-order factors as indicators of one second-order factor (i.e., student covitality), both indicated good data–model fit and strong internal reliability with the present sample. Additionally, results showed that both measurement models had substantive and relatively similar predictive power, characterized by moderate to large effect sizes, for accounting for the variance in all of the problem behaviors of interest. Findings regarding the predictive validity of the first-order measurement model further indicated that the predictive power of this model was primarily limited to two of the four students subjective wellbeing factors: academic efficacy and educational purpose. Implications for theory, practice, and future research are discussed.

Keywords Student subjective wellbeing · Positive psychology · Problem behaviors · Adolescents

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Much research has been conducted with youth for the purposes of measuring their subjective wellbeing (Gilman and Huebner 2003; Huebner et al. 2004). Within this tradition, subjective wellbeing has traditionally been assessed using self-report behavior rating scales targeting experiences of positive affect and life satisfaction (Diener et al. 2009). However, considering that *wellbeing* is a broad construct referring to all manner of healthy human functioning and that *subjective* is a referent to self-perceptions of experience, the term *subjective wellbeing* is technically appropriate for any self-reported indicator of desirable private behavior (i.e., thoughts and feelings) or public behavior (i.e., overt actions; Renshaw 2016a). Seligman's (2011) PERMA model exemplifies this broader notion of wellbeing, operationalized as (P) positive emotions, (E) engagement, (R) relationships, (M) meaning, and (A) accomplishment. Renshaw et al. (2015) offer a similarly broad model of subjective wellbeing that is targeted to youth in school contexts, operationalized as joy of learning (positive emotion and engagement), school connectedness (relationships), educational purpose (meaning), and academic efficacy (accomplishment). Furthermore, Furlong et al. (2014a, b) advocate an even broader model of youths' subjective wellbeing, operationalized via several indicators accounting for positive emotion (i.e., gratitude, optimism, zest), relationships (i.e., peer support, school support, family support), meaning (i.e., self-awareness), and accomplishment (i.e., self-efficacy, persistence), as well as a few social–emotional competencies that facilitate these core wellbeing indicators (i.e., emotional regulation, self-control, and empathy). While these multidimensional models of youths' wellbeing vary according to the quantity and content of their indicators, they have all been validated using a similar measure development strategy.

To date, research investigating broader, multidimensional models of youths' subjective wellbeing has focused largely on proposing and validating theoretically coherent measurement models using exploratory and confirmatory factor analyses (e.g., Furlong et al. 2013; Furlong et al. 2014a, b; Renshaw et al. 2015), replicating those measurement models with similar samples (Renshaw 2015; You et al. 2014), and then generalizing those models across diverse samples of youth (You et al. 2015; Renshaw 2016b; Renshaw and Arslan 2016). Most of this work could be considered "basic science," as the treatment utility of these multidimensional measurement models has yet to be empirically vetted (see Hayes et al. 1987, for more on treatment utility; see Dowdy et al. 2015, for a preliminary step toward treatment utility in this line of research). Given the nascent state of the science of youths' subjective wellbeing, the imbalanced focus on basic research at the expense of applied research targeting treatment utility is both expected and understandable. In fact, we suggest that at least two further basic research questions regarding youths' subjective wellbeing warrant investigation prior to shifting the emphasis of validation studies toward treatment utility. First, do measures of youths' multidimensional subjective wellbeing have predictive validity for valued youth outcomes—such as lower levels of specific problem behaviors (e.g., substance use) and higher levels of specific wellbeing behaviors (e.g., academic achievement)? And second, do different approaches to modeling student subjective wellbeing yield differential predictive validity in relationship to such outcomes?

Regarding the first question, previous research demonstrates that overall student subjective wellbeing, when modeled as a generalized continuous variable often referred to as *covitality*, is significantly and strongly predictive of several valued youth outcomes: school prosociality ($\beta = .83$) and academic perseverance ($\beta = .99$, Renshaw

et al. 2015), personal adjustment (β = .72) and internalizing problems (β = −.69, Jones et al. 2013; β = −.70, Renshaw and Bolognino 2016), global problem behavior (β = −.63; You et al. 2014), and other global subjective wellbeing (β = .89; Furlong et al. 2014a, b; β = .57, Kim et al. 2014; β = .97, Renshaw and Bolognino, 2016). Other analyses, which have transformed overall student wellbeing composite scores into categorical variables (created via *SD*-derived cut-offs common to standardized testing and assessment) representing lower to higher levels of covitality, show moderate relations to academic achievement (η^2_p = .12, Renshaw et al. 2015; R^2 = .08, Furlong et al. 2014a, b; R^2 = .18, Renshaw and Bolognino 2016), cumulative risks (η^2_p = .08) and cumulative assets (η^2_p = .11; Renshaw 2015), as well as various significant relationships with a range of small-to-large effect sizes (odds ratios) with specific risks and assets (Furlong et al. 2013; Renshaw et al. 2015). You et al. (2014) have also demonstrated that covitality is related to youth's actual grade point averages derived from school-reported data, although this effect yielded a markedly smaller effect size (R^2 = .04) compared to the relationships observed between covitality and self-reported achievement in previous studies. When considering the nature of the valued outcomes used as criterion variables in previous studies, it is clear that the majority represent very general classes of behavior (e.g., global problem behavior and academic achievement) as opposed to indicators of more specific classes of target behavior (e.g., substance use and mathematics performance). Taken together, then, these findings suggest further research is warranted to more firmly establish the relationship between student subjective wellbeing and particular valued youth outcomes.

Regarding the second question, it is noteworthy that all of the concurrent validity analyses discussed above were carried out using the higher-order covitality factor or classifications derived from this single composite score, and that no study investigating multidimensional student subjective wellbeing has yet to investigate the concurrent or predictive validity of the first-order factors underlying the covitality construct (cf. Furlong et al. 2014a, b; Renshaw et al. 2015; Renshaw 2015). This analytic strategy is comprehensible in light of the theory used to frame covitality, which positions it as the counterpart to the well-known mental health concept of *comorbidity*, which is considered to be a stronger predictor of impairment than are isolated mental health problems (see Renshaw et al. 2014, for more on covitality; see Degenhardt et al. 2003, for more on comorbidity). Additionally, the theory underlying covitality is grounded in the childhood resilience and positive youth development literatures (Furlong et al. 2014b), which posit that greater numbers of youths' cumulative assets, such as environmental supports and personal skills, contribute to stronger predictive power in relation to valued outcomes (e.g., Scales 1999; Scales et al. 2006). The scientific principle of Ockham's Razor has also been used as an empirical justification for covitality, noting that higher-order measurement models are more structurally parsimonious than their first-order counterparts (Furlong et al. 2013; Furlong et al. 2014a, b). Given these theoretical rationales, Furlong and colleagues (2014b) have proposed that covitality is analogous to the "*g* factor" that is central to modern intelligence theory. Just as the "*g* factor" is posited to give rise to all other intelligences and is typically selected as the best overall indicator of intellectual functioning, covitality is posited to give rise to all other aspects of subjective wellness and is therefore preferred as the best overall indicator of student wellbeing. Although the tendency to privilege covitality as the analytic construct of interest in previous research and to draw implications from this

approach to practice appears conceptually reasonable given the tenets outlined above, it is noteworthy that, unlike modern intelligence theory, this logic has yet to be validated via empirical research.

Previous studies demonstrate that the covitality construct consistently yields robust estimates of latent construct reliability (H = .95, Furlong et al. 2014a, b; H = .86, Jones et al. 2013; H = .89, Renshaw 2015; H = .92, Renshaw et al. 2015; H = .98, You et al. 2014), which are consistently stronger than the construct reliability estimates of its component indicators. Previous research also shows that measurement models including covitality as a second-order latent construct are more parsimonious (i.e., estimate fewer parameters) and have similarly good data–model fit compared to models structuring the component wellbeing indicators as distinct yet correlated constructs (Furlong et al. 2013; Furlong et al. 2014a, b; Renshaw et al. 2015; Renshaw 2015). However, all previous studies have failed to test the predictive validity of higher-order covitality models in comparison to first-order factor models, simply assuming that the covitality model would have incremental validity, for the conceptual reasons mentioned above, without demonstrating this fact empirically. Thus, there is currently no direct evidence indicating that covitality models of student subjective wellbeing have comparable or stronger predictive power in relation to valued youth outcomes than first-order factor models, and there is therefore no empirical reason beyond simple structural parsimony to privilege higher-order measurement models for such multidimensional measures.

Considering the context sketched above, the purpose of the present study was to progress this line of research regarding multidimensional student subjective wellbeing by directly testing the comparative validity of two measurement models—the covitality model versus the first-order factors model—for predicting several specific adolescent problem behaviors: antisocial behaviors, alcohol use, tobacco use, suicidal tendencies, nutrition habits, and school dropout. Given the previously encouraging findings regarding the relation of youths' subjective wellbeing to a variety of general classes of mental health and wellbeing behavior (e.g., Furlong et al. 2014a; Renshaw et al. 2015; Renshaw 2015), we hypothesized that significant and substantive relationships would be observed between predictor and criterion variables in the expected directions. Furthermore, considering Furlong et al.'s (2014a, b) and Renshaw et al.'s (2014) theoretical rationale for preferring the covitality construct, we further hypothesized that the covitality measurement model would yield stronger predictions of all concurrent youth outcomes compared to the first-order factors model. That said, the practical upshot of this study was intended to be twofold. First, as noted above, results were intended to provide a warrant for the applied use of multidimensional subjective wellbeing measures in schools by establishing relationships with meaningful and more particular valued outcomes. And second, findings were intended to warrant the preference of one measurement model over the over (i.e., covitality vs. first-order factors) by investigating their comparative validity, as applied use of such measures in schools requires that practical decisions be made regarding scoring and interpretation of both subscales and composite scales. Overall, then, we expected results from the present study would help guide future basic research as well as help inform treatment utility research in this area by generating evidence-based recommendations, as opposed to offering purely conceptual rationales, for understanding and using multidimensional student subjective wellbeing measures.

1 Method

1.1 Participants

Participants consisted of 374 students enrolled in Grades 9–12 in a public high school located in a small urban city in Turkey. The sample consisted of 55.1% female and 44.9% male adolescents, who ranged in age from 14 to 19 years (M = 16.052, SD = .871). The participants self-identified as having a range of socioeconomic statuses (low SES = 16.6%, medium SES = 26.3%, and high SES = 57.1%), yet all students were of the same ethnic background. A paper-and-pencil survey, which was comprised of demographic questions as well as self-report measures of subjective wellbeing and problem behavior (described below), was distributed to and completed by all participants during school hours. All students completed the surveys within approximately 30 min, following which all surveys were collected and processed into an electronic database for the purposes of data analyses.

1.2 Measures

Student Subjective Wellbeing Questionnaire (SSWQ) The SSWQ (Renshaw et al. 2015; Renshaw 2015), which was developed to measure youth's school-specific subjective wellbeing, is a 16-item self-report instrument comprised of four, 4-item subscales: Joy of Learning (JL; e.g., "I feel happy when I am working and learning at school"), School Connectedness (SC; e.g., "I feel like people at this school care about me"), Educational Purpose (EP; e.g., "I feel like the things I do at school are important"), and Academic Efficacy (AE; e.g., "I am a successful student"). All subscale scores can be combined to form an overall Student Covitality Scale (COVI) composite score. Items on the SSWQ are rated using a 4-point Likert-type scale (1 = *almost never*, 2 = *sometimes*, 3 = *often*, 4 = *almost always*) and require no reverse scoring. As described above (see the Introduction), previous research has indicated that the original English version of the SSWQ has strong internal consistency and that it demonstrates convergent validity with a variety of general youth outcomes (Renshaw et al. 2015; Renshaw 2015). The Turkish version of the SSWQ, which was recently validated by Renshaw and Arslan (2016) following the recommendations of the (International Test Commission 2005), consists of the same number of items and has also demonstrated robust internal consistency and convergent validity with other indicators of school-specific subjective wellbeing. The internal consistency of the SSWQ's first-order subscales (i.e., JL, SC, EP and AE) with the present sample was observed to be adequate-to-strong, the internal consistency of the second-order COVI scale was very strong, and the distributionality of all scales was observed to be relatively normal (see Table 1). The data–model fit of the SSWQ's measurement model with the present sample is presented below as part of the primary results.

Risk Behaviors Scale (RBS) The RBS is a Turkish measure that was used in the present study to assess specific problem behaviors in adolescents (Gençtanırım and Ergene 2014). The RBS is comprised of 36 items that make up six subscales: antisocial behavior (7 items; AB), alcohol use (7 items; AU), tobacco use (6 items; TU), suicidal tendencies (4 items; ST), nutrition habits (5 items; NH), and school dropout (7 items;

Table 1 Descriptive characteristics for observed variables

Variable	Items	Min.	Max.	*M*	*SD*	Skew.	Kurt.	α
SC	4	4	16	11.30	3.14	−.34	−.61	.75
JL	4	4	16	10.63	3.38	−.16	−.80	.84
EP	4	4	16	12.03	3.43	−.72	−.31	.85
AE	4	4	16	11.56	3.16	−.49	−.36	.86
SCC	16	17	64	45.56	11.13	−.41	−.47	.92
AB	7	7	35	14.73	6.52	.89	.17	.84
AU	7	7	35	9.81	5.58	2.35	4.97	.91
TU	6	6	30	10.23	6.67	1.59	1.41	.91
ST	3	3	15	11.55	3.59	.19	−.16	.74
NH	5	5	25	13.88	5.13	.29	−.55	.77
SD	7	7	35	11.47	6.01	1.66	2.43	.86

JL joy of learning, *SC* school connectedness, *EP* educational purpose, *AE* academic efficacy, *SCC* student covitality composite, *AB* antisocial behaviors, *AU* alcohol use, *TU* tobacco use, *ST* suicidal tendency, *NH* nutrition habits, *SD* school dropout

SD). Scores from these subscales can also be combined to create an overall Problem Behaviors composite scale. All items on the RBS are directly phrased to represent the problems of interest (e.g., "I feel desperate towards my problems" and "I go out to drink alcohol with my friend secretly from my family") and are accompanied by a five-point Likert-type scale, ranging from *absolutely not appropriate* (1) to *absolutely appropriate* (5), which asks youth to rate their level of agreement with how well the phrase describes their behavior. Previous research has shown that the internal consistency and test–retest reliabilty of the RBS subscales are adequate to very strong (Gençtanırım and Ergene 2014). The internal consistency of the RBS's subscales with the present sample was also observed to be adequate-to-strong, and the distributionality of the majority of subscales was observed to be relatively normal (skewness and kurtosis < |2|; see Table 1). Confirmatory factor analysis with present sample indicated that the RBS measurement model had good data–model fit (χ^2 = 1502.488, *df* = 588, $p < .001$, CFI = .932, TLI = .921, RMSEA [90% CI] = .065 [.061, .069], SRMR = .066). However, the 21st item ("I have full confidence in myself"), which was part of the suicidal tendencies subscale, had a low factor loading (λ = .13) and was therefore excluded from the measurement model. A follow-up confirmatory factor analysis indicated good data–model fit for this revised measurement model (χ^2 = 1421.351, *df* = 554, $p < .001$, CFI = .943, TLI = .929, RMSEA [90% CI] = .065 [.061, .069], SRMR = .065). Adequate to strong construct reliability was also observed for all first-order latent factors represented by the RBS's subscales (AB *H* = .86, AU *H* = .93, TU *H* = .92, ST *H* = .71, NH *H* = .77, SD *H* = .86) as well as for the second-order Problem Behaviors factor (*H* = .90).

1.3 Analytic Approach

Data analyses were conducted in three phases. In phase one of the analyses, observed variable characteristics were examined. Surveys characterized by invalid response

patterns (≥ 10% missing data) were excluded from future analyses, and normality assumptions were assessed using skewness and kurtosis scores, as recommended by Kline (2010). Following, confirmatory factor analyses (CFA) were conducted to examine the psychometric properties of SSWQ's first-order and second-order measurement models with the present sample. Results from these analyses were interpreted using common data–model fit statistics, including the comparative fit index (CFI), Tucker Lewis index (TLI), the root mean square error of approximation (RMSEA; with an accompanying 90% confidence interval), and standardized root mean square residual (SRMR). CFI and TLI values between .90 and .95 were considered to indicate adequate data–model fit, while values > .95 were considered indicative of good data–model fit. RMSEA and SRMR values between .05 and .08 were considered to indicate adequate data–model fit, while values < .05 were considered indicative of good data–model fit (Kenny 2014; Kline 2010). In phase two of the analyses, the predictive validity of the two student subjective wellbeing measurement models (i.e., first-order and second-order) in relation to specific problem behaviors (i.e., AB, AU, TU, ST, NH, and SD) was investigated. Prior to these analyses, however, bivariate correlations were conducted between the observed SSWQ scale scores and the RBS scale scores to obtain a preliminary estimate of relations among the variables of interest. The magnitude of these correlations (r) were interpreted using conventional standards: .00–.09 = negligible, .10–.29 = small, .30–.49 = moderate, ≥ .50 = large. Following, the predictive power of the respective measurement models for estimating each of the observed problem behaviors was examined using a series of latent variable path analyses (LVPA). The structural difference between these series of LVPA are represented in Fig. 1, using a single "problem behaviors" observed variable to simplify for modeling purposes. Findings from the LVPA were assessed using the same data–model fit indices described above as well as by considering standardized path coefficients (β) and their associated squared-multiple correlations (R^2). The magnitude of R^2 was also interpreted using traditional effect size standards: .00–.009 = negligible, .01–.059 = small, .06–.139 = medium, > .14 = large. All data analyses were conducted using SPSS and AMOS version 22.

2 Results

2.1 Preliminary Analyses

Findings from the preliminary analyses indicated that all SSWQ items were characterized by a relatively normal distribution, with skewness and kurtosis values ranging from .02 to −1.12. CFA was therefore conducted using the Maximum Likelihood estimation method. Results from the first CFA, which modeled the first-order student subjective wellbeing factors (i.e., JL, SC, EP, and AE) as fully-correlated, indicated good data–model fit ($\chi^2 = 290.82$, $df = 98$, $p < .001$, CFI = .935, TLI = .921, SRMR = .045, RMSEA [90% CI] = .073 [.063, .082]) and was characterized by large inter-factor correlations (JL–SC ϕ = .69, JL–EP ϕ = .80, JL–AE ϕ = .74, SC–EP ϕ = .63, SC–AE ϕ = .64, EP–AE ϕ = .75, $p < .001$). Findings from the second-order CFA, which extended the former measurement model by structuring the four first-order factors as indicators of the higher-order Student Covitality factor, yielded similarly good data–

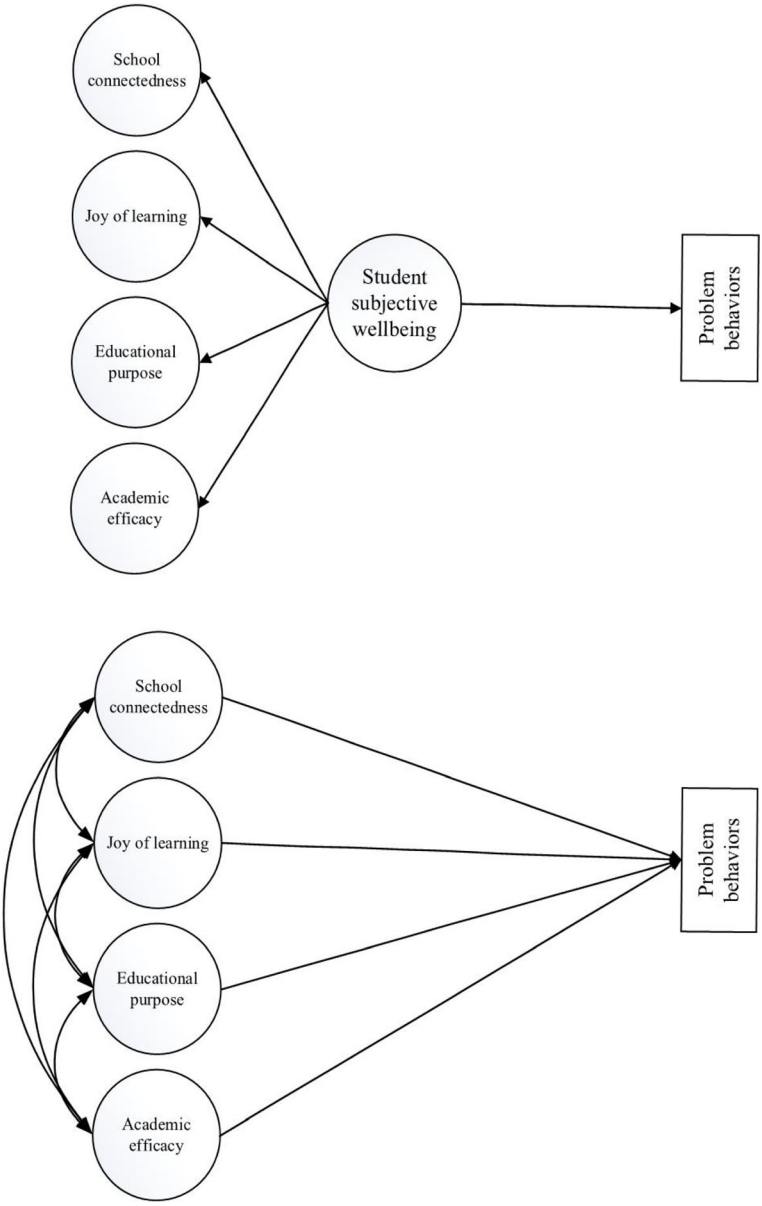

Fig. 1 Visual representations of the series of LVPA models

model fit (χ^2 = 293.36, *df* = 100, $p < .001$, CFI = .935, TLI = .922, SRMR = .046, RMSEA [90% CI] = .072 [.063, .082]). Results from the higher-order CFA also indicated that factor loadings (λ) were strong for each first-order factor, ranging from .52 to .81 (associated ℓ^2 ranging from .27 to .67), as well as for the second-order factor, ranging from .74 to .90 (associated ℓ^2 ranging from .55 to .81). Construct reliability coefficients (*H*) for all latent factors in the measurement model were adequate, ranging from .77 to .92 (see Table 2). Taken together, findings from the preliminary analyses

suggested that both SSWQ measurement models had satisfactory psychometric properties and, thus, that both were appropriate for use within the primary analyses to model as predictors of student problem behaviors.

2.2 Primary Analyses

Findings from the correlational analyses conducted between the SSWQ's observed scale scores and the RBS's observed scale scores indicated that all student subjective wellbeing subscales were significantly correlated with each of the problem behavior subscales, with effect sizes ranging from small to moderate, whereas the COVI composite score demonstrated a range of small-to-large correlations with scores derived from each of the problem behavior subscales (see Table 3). Considering these promising relations, the series of LVPA were carried out to test the potential differential predictive validity of the SSWQ's first-order and second-order measurement models. Findings from the first series of LVPA showed that the second-order covitality model indicated good data–model fit statistics, with standardized path coefficients ranging from −.23 to −.47 and the predictive power (indicated by R^2) of the covitality construct varying

Table 2 CFA findings for the SSWQ's higher-order measurement model

Factor and Items	λ_1	$\ell^2{}_1$	λ_2	$\ell^2{}_2$	*H*	*RFE*
Joy of Learning	—	—	.90	.81	.83	—
I get excited about learning new things in class.	.80	.64	—	—	—	.65
I am really interested in the things I am doing at school.	.75	.56	—	—	—	.61
I enjoy working on class projects and assignments.	.74	.55	—	—	—	.60
I feel happy when I am working and learning at school.	.64	.41	—	—	—	.52
School Connectedness	—	—	.74	.55	.77	—
I feel like I belong at this school.	.69	.48	—	—	—	.38
I can really be myself at this school.	.74	.55	—	—	—	.41
I feel like people at this school care about me.	.70	.49	—	—	—	.39
I am treated with respect at this school.	.52	.27	—	—	—	.29
Educational Purpose	—	—	.88	.78	.87	—
I feel like the things I do at school are important.	.65	.42	—	—	—	.51
I think school matters and should be taken seriously.	.80	.64	—	—	—	.62
I feel it is important to do well in my classes.	.81	.65	—	—	—	.63
I believe the things I learn at school will help me in my life.	.82	.67	—	—	—	.64
Academic Efficacy	—	—	.83	.70	.86	—
I am a successful student.	.71	.51	—	—	—	.50
I do good work at school.	.81	.65	—	—	—	.57
I do well on my class assignments.	.80	.64	—	—	—	.56
I get good grades in my classes.	.77	.59	—	—	—	.54
Student Covitality	—	—	—	—	.92	

λ_1 first-order factor loadings, $\ell^2{}_1$ indicator reliability for first-order factor items, λ_2 second-order factor loadings, $\ell^2{}_2$ indicator reliability for second-order factor indicators, *H* latent construct reliability, *RFE* residualized first-order factors effects

Table 3 Bivariate correlations (r) between the SSWQ scale scores and problem behaviors

SSWQ Scale	AA	AU	TU	ST	NH	SD
Joy of Learning	−.395**	−.181**	−.267**	−.249**	−.176**	−.273**
School Connectedness	−.304**	−.247**	−.217**	−.231**	−.149**	−.250**
Educational Purpose	−.366**	−.256**	−.266**	−.209**	−.180**	−.326**
Academic Efficacy	−.390**	−.285**	−.302**	−.196**	−.164**	−.333**
Student Covitality	−.540**	−.282**	−.314**	−.268**	−.203**	−.361**

** All values were significant at the $p < .001$ level. *AB* antisocial behaviors, *AU* alcohol use, *TU* tobacco use, *ST* suicidal tendency, *NH* nutrition habits, *SD* school dropout

across the problem behavior outcomes from moderate to large (see Table 4). Following, results from the second series of LVPA showed that the first-order model yielded good data–model fit across all predicted problem behaviors (see Table 5). Consideration of the standardized path coefficients from this first-order model further indicated that academic efficacy was a significant predictor of antisocial behaviors, alcohol use, tobacco use, and school dropout, while educational purpose significantly predicted alcohol use and school dropout, and that no other first-order factors significantly predicted any of the other observed problem behaviors (see Table 5). Taken together, results from comparing the predictive validity of first-order and second-order models suggest that both evidenced similar predictive power in relation to adolescent problem behaviors, with the observed effect sizes differing only slightly between models.

3 Discussion

3.1 Interpretation of Results

The present study addressed two outstanding research questions: First, do measures of youths' multidimensional subjective wellbeing have predictive validity for particular youth problem behaviors? And second, do different approaches to modeling multidimensional student subjective wellbeing (first-order versus second-order) yield differential predictive power in relation to such outcomes? We hypothesized that the answer

Table 4 Covitality model LVPA: Fit statistics, path coefficients, and effect sizes

Outcome	χ^2	CFI	TLI	SRMR	RMSEA [90% CI]	β	R^2
AB	320.249	.933	.921	.046	.069 [.060–.078]	−.47**	.22
AU	337.036	.927	.913	.048	.072 [.063–.081]	−.30**	.09
TU	310.644	.935	.923	.045	.068 [.059–.077]	−.35**	.12
ST	309.807	.935	.923	.045	.067 [.058–.076]	−.38**	.14
NH	307.266	.936	.924	.044	.067 [.058–.076]	−.23**	.06
SD	329.941	.929	.916	.047	.071 [.062–.080]	−.39**	.15

$df = 115$, ** all values were significant at the $p < .001$ level. *AB* antisocial behaviors, *AU* alcohol use, *TU* tobacco use, *ST* suicidal tendency, *NH* nutrition habits, *SD* school dropout, *PB* total problem behaviors

Table 5 Correlated-components model LVPA: fit statistics, path coefficients, and effect sizes

Model	χ^2	CFI	TLI	SRMR	RMSEA[90% CI]	JL β	SC β	EP β	AE β	R^2
AB	316.615	. 932	.906	.046	.071 [.062–.080]	−.23	.04	−.10	.25***	.21
AU	326.475	.929	.912	.047	.074 [.063–.082]	.24	−.13	−.24**	.21**	.11
TU	305.619	.935	.920	.044	.069 [.060–.078]	−.08	.02	−.07	.24**	.12
ST	302.349	.936	.921	.044	.68 [.059–.078]	−.18	−.13	−.06	−.04	.14
NH	304.675	.935	.919	.044	.069 [.060–.078]	−.10	−.01	−.06	−.07	.05
SD	322.231	.930	.914	.046	. 072 [.063–.081]	−.01	.09	−.26**	−.23**	.16

df = 110 for all χ^2 values was significant at the $p < .001$ level. ** $p < .01$, *** $p < .001$. *JL* joy of learning factor, *SC* school connectedness factor, *EP* educational purpose factor, *AE* academic efficacy factor, *AB* antisocial behaviors, *AU* alcohol use, *TU* tobacco use, *ST* suicidal tendency, *NH* nutrition habits, *SD* school dropout

to the first question would be "yes," and findings from both series of LVPA support this hypothesis—demonstrating that student subjective wellbeing, whether using the first-order or second-order measurement model, is a substantive predictor of all of the particular problem behaviors investigated herein: antisocial behaviors, alcohol use, tobacco use, suicidal tendencies, nutrition habits, and school dropout. Prior to this study, most studies had validated youth subjective wellbeing measures with other self-reported indicators of global mental health problems or problem behavior, making little information available regarding the relationship between subjective wellbeing and particular problem behaviors. Thus, the present findings extend this line of validation research for the SSWQ in particular, and for student subjective wellbeing in general, by demonstrating that the these constructs are indeed related to specific problem behavior indicators. Taken together, then, we suggest these findings provide an initial warrant for investigating the treatment utility of the SSWQ and similar measures within school contexts, as the constructs it measures appear to have meaningful relations with problem behaviors targeted by common school-based prevention and intervention programs. That said, considering Renshaw and Bolognino's (2016) findings that school-specific subjective wellbeing was a stronger predictor of students' quality of life outcomes than domain-general wellbeing, future research is also warranted to compare the predictive power of responses to the SSWQ to that of domain-general measures of youths' wellbeing, such as the Social and Emotional Health Survey (SEHS; Furlong et al. 2014a, b; You et al. 2014), as well as other school-specific subjective wellbeing measures, such as the Positive Experiences at School Scale (PEASS; Furlong et al. 2013; Renshaw 2016b). Until such research is accomplished, we must technically conclude that the present study demonstrates only that multidimensional *student* subjective wellbeing, not necessarily *youth's* subjective wellbeing, has predictive validity in relation to a variety of specific adolescent problem behaviors.

In response to the second research question, we assumed Furlong et al.'s (2014b) theoretical rationale and hypothesized that the second-order covitality model of student subjective wellbeing would be a more robust predictor of specific adolescent problem behaviors than the first-order model that structured all student subjective wellbeing factors as correlated components. Interestingly, results failed to support our hypothesis,

showing that, for each problem behavior indicator, the first-order model had approximately similar predictive power in comparison to the covitality model, differing by only a few percentage points of variance explained—sometimes in favor of the second-order model, other times in favor of the first-order model. It is also noteworthy that AE and EP were the only latent factors within the first-order model to demonstrate significant predictive validity in relation to problem behaviors, suggesting that these particular aspects of subjective wellbeing have pivotal relations with student functioning. These trends in results, which vary in magnitude but not in direction for each outcome, somewhat underminet the theoretical rationale for privileging covitality as the analytic construct of interest. For example, Furlong et al. (2014b, p. 28) posited that "more important than developing any single psychological disposition (e.g., persistence, optimism, empathy) is fostering the development of as many of them as possible" and, similarly, that the "combination of strengths matters more than the individual components—the sum is greater than the parts." Yet findings from the first-order model suggest that one or two constructs can account for the predictive power of the measurement model without considering the second-order covitality construct. We reiterate that this conceptual rationale, which can be described in colloquial terms as "The more [wellbeing], the merrier [the outcomes]!", has heretofore been *theoretically assumed* to be the most robust predictive model, yet findings from the present study *empirically demonstrate* that its predictive power is not superior to the first-order model.

3.2 Limitations and Future Research

Results from the present study should be considered in light of at least three key methodological limitations. First, the sample of students was derived from only a single public high school in Turkey, suggesting the results are not generalizable to other schools in the same region nor to youths with demographically dissimilar backgrounds in other nations. To remedy this sampling limitation, future research is warranted to replicate the methodology of the present study with demographically similar youth in other schools as well as to investigate the generalizability of these findings with diverse samples of youth, including students from varying racial/ethnic backgrounds as well as youth enrolled in schools within rural and suburban cities. Considering the importance of replication and generalizability research for advancing psychological science (Kline 2008), the inferences derived from results observed with the present sample should be carefully interpreted and considered provisional. Second, this study used a single self-report measure, the SSWQ, to represent multidimensional student subjective wellbeing, and therefore inferences from findings should be limited to the context of that instrument's measurement model and, in turn, should not be generalized to other measures of youths' subjective wellbeing (e.g., Furlong et al. 2013; Furlong et al. 2014a). Future research is therefore warranted to test the generalizability of the phenomena observed in the present study using other self-reported measures of subjective wellbeing, which have differing measurement models, to predict particular adolescent problem behaviors. Finally, we wish to reiterate that the findings of the present study were intentionally limited to predictive validity relative to specific problem behaviors, and thus the comparative predictive power of the SSWQ's first-order and second-order measurement models should not be overgeneralized to other valued youth outcomes, such as

academic achievement or other wellbeing behavior indicators. Rather, further inquiry is needed to investigate the generalizability of these findings with alternative outcomes of interest.

4 Conclusion

From the beginning, the intention underlying the development of multidimensional measures of youths' subjective wellbeing—and, specifically, the covitality construct derived from such measures—has been to create psychometrically sound instruments and assessment approaches that could be used for practical purposes within school-based service delivery systems. For example, Furlong et al. (2014a, b) and Renshaw et al. (2014) suggest that covitality scores could be used to inform individualized assessments and schoolwide screening, progress monitor strength-based interventions, and track district and school-level trends in youth wellbeing. They also suggest that covitality may be a useful construct for operationalizing the wellbeing component within dual-factor (or two-continua) approaches to assessing and promoting youths' mental health (Dowdy et al. 2015; see Suldo and Shaffer 2008, for more on the dual-factor model). Yet findings from this study provide evidence suggesting the covitality construct may not be as useful as previously assumed, or at least that it might only be just as useful as considering isolated but correlated indicators of student subjective wellbeing. Although enthusiastic about the potential of covitality, Furlong et al. (2014a) have emphasized the tentative nature of the construct, noting that the measurement models operationalizing it are intended to be representative and pragmatic, not exhaustive or philosophically ontological. They have also emphasized the fact that "additional research is needed to better understand which combinations of positive-psychological constructs are associated with particular desired developmental outcomes" (Furlong et al. 2014a). We therefore encourage others interested in this line of work to replicate, generalize, and extend the methodology and findings of the present study in order to obtain a greater understanding of the potential utility of the covitality construct. We also recommend that future scholarship explore reconceptualizations of student subjective wellbeing as valued outcomes or ends in themselves, not only as predictors of such outcomes.

Compliance with Ethical Standards

Conflict of Interest The authors declare no conflict of interest.

Experiment Participants The experimental protocol was approved by the authors' institutional review board and meets all requirements laid out by governing agencies for ethical research.

Funding No funding was received to support the present research.

Ethical Approval All procedures involving human participants in this study were conducted in accordance with the ethical standards of the authors' institutional research committees and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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

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