

The Well-Being Index (WBI) for Schools: A Brief Measure of Adolescents' Mental Health

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Schools are increasingly concerned with the well-being of the whole child – likely, more so since the COVID-19 pandemic – and goals here were to document the psychometric properties of a brief new measure of adolescent mental health, the Well-Being Index (WBI). The measure assesses 4 symptom areas, 2 each of internalizing and externalizing symptoms—Depression, Anxiety, Rule-Breaking, and Substance Use—and an optional scale on Isolation at School. A total of 2,444 students from 2 high schools completed the WBI, the Youth Self-Report (YSR), and other related measures. Alpha coefficients showed acceptable internal consistency, with values for the 5 WBI subscales at .83, .84, .78, .79, and .74, respectively. Both exploratory and confirmatory factor analyses demonstrated consistent factorial validity. Correlations with corresponding YSR subscales indicated good convergent and discriminant validity. The WBI Substance Use and Isolation at School subscales, similarly, had high correlations with subscales from preexisting measures. Criterion-related validity was indicated in significant correlations between WBI subscales and conceptually related dimensions of close relationships. Also examined was the percentage of youth falling above clinical cutoffs on both the WBI and YSR, and findings demonstrated high concurrent validity. Collectively, results suggest the promise of the WBI as a brief, psychometrically sound measure to assess the adjustment of adolescents, along with perceptions of school climate that can be modified toward fostering their overall well-being.

Public Significance Statement

This article establishes good psychometric properties of a brief measure of common adolescent symptoms: depression, anxiety, rule-breaking, and substance use. Its brevity allows for widespread administration in school-based assessments of mental health; these are especially important given documented increases in (a) overall distress levels among teenagers over the years and (b) expectations that schools must play a major role in monitoring and promoting youth well-being.

Keywords: adolescents, symptoms, COVID-19, schools, well-being

Schools are increasingly concerned about the mental health of their students, given reports of increases in anxiety, depression, rule-breaking behaviors, and substance use among youth in recent years

(see American Psychological Association [APA], 2018; Luthar, Kumar, & Zillmer, 2019). However, measures used to assess adolescents' mental health either take a substantial amount of time to administer, or when brief, are narrow in scope. Additionally, there is rarely consideration of students' feelings of isolation at school: the degree to which they feel alienated from others as opposed to connected. Our goal in this study was to assess a brief, psychometrically sound measure that could capture overall mental health of students at the school level, enabling comparisons across institutions as well as within them (with the latter illuminating subgroups that might be especially vulnerable).

Schools' Assessments of Students' Mental Health

With the current generation of adolescents reporting higher levels of stress and depression than those before them (APA, 2018; Twenge, Cooper, Joiner, Duffy, & Binau, 2019), schools today are

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increasingly charged with helping ensure youths' psychological well-being. In point of fact, there is now a clearly articulated national emphasis on mental health literacy among teachers, wherein they are charged with not only traditional teaching of academic subjects but also with promoting their students' good mental health (Leschied, Saklofske, & Flett, 2018). Vigilance for students' mental health, in turn, requires regular assessments of adjustment levels in problem areas that are common among teens, using measures that are psychometrically sound and yet efficient to administer.

Extant Measures of Youth Mental Health

Considering existing self-reported measures of symptoms across multiple domains, some of the best, most widely used instruments are lengthy. For example, the Youth Self-Report (YSR), generally considered to be the gold-standard assessment tool, has a total of 112 items, measuring multiple symptoms in both the internalizing and externalizing categories, as well as social competence (Achenbach & Rescorla, 2001). Similarly, the Behavior Assessment System for Children (BASC) has a total of 160 items and was designed to measure the behavior and self-perceptions of children and adolescents between four and 18 years of age (Reynolds & Kamphaus, 1992). The Beck Youth Inventories, second edition, is a set of norm-referenced diagnostic scales designed to assess children and adolescents between the ages of seven and 18 in areas of Depression, Anxiety, Anger, Disruptive Behavior, and Self Concept. Each inventory of the Beck Youth Inventories takes 5–10 min to administer, but the full "combination" inventory, spanning both internalizing and externalizing symptoms, takes between 30 min and 1 hr (Beck, Beck, Jolly, & Steer, 2005).

Whereas these comprehensive measurements are invaluable when evaluating youth in clinical settings (e.g., in assessments for treatment goals in psychotherapy), they tend to be less practical for use in school-based studies on students' well-being. The latter typically involve assessment not just of symptoms, but also of multiple risk and protective factors that might affect students' adjustment levels (e.g., see Luthar & Kumar, 2018). In general, schools are reluctant to allow more than one 45- to 50-min class period to administer surveys on students' psychological and behavioral adjustment.

Considering, on the other hand, existing measures of symptoms that have the advantage of being brief and thus more feasible for school-wide assessments, these tend to focus on limited domains of youths' maladjustment. To illustrate, the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) is a 20-item scale designed to measure depressive symptoms; this instrument, however, does not assess other areas that are important during adolescence, including anxiety (APA, 2018), rule-breaking, and drugs and alcohol use (Moffitt, 2003). Similarly, there are several relatively brief measures that encompass only externalizing problems. The Self-Report Delinquency Checklist (SRD; Huizinga & Elliot, 1986) contains 37 items assessing the seriousness of delinquent behaviors (including substance use), but no internalizing symptoms. The widely used 53-item Youth Risk Behavior Survey was designed to measure behaviors related to intentional and unintentional injury, tobacco use, alcohol and other drug use, sexual activity, diet, and physical activity (Brener, Collins, Kann, Warren, & Williams, 1995; Centers for Disease Control and Pre-

vention, 1995). While the Youth Risk Behavior Survey does measure substance use, it does not have psychometrically validated subscales (with multiple, internally consistent items, as in the YSR or BASC) that measure depression, anxiety, or rule-breaking.

Development and Validation of the Well-Being Index

In view of the literature presented, goals of this study were to test the psychometric promise of a new measure of adolescents' mental health—the Well-Being Index (WBI; Kumar, 2019)—that assesses both internalizing and externalizing symptoms and yet is brief. This measure was developed for use in school-based assessments of students' psychosocial and behavioral adjustment, keeping in mind the problem areas most commonly seen among adolescents. Within the internalizing domain, these include depression and anxiety, and within the externalizing domain, included are rule-breaking and substance use (Achenbach & Rescorla, 2001). Thus, the WBI contains five items each to assess depression, anxiety, and rule-breaking, to be completed on a 5-point Likert scale (Kumar, 2019). To measure substance use, the WBI entails the use of five items, verbatim, from the publicly available Monitoring the Future Study (Johnston, O'Malley, Bachman, Schulenberg, & Miech, 2014).

With regard to procedures used to develop WBI items, the literature was reviewed to identify symptoms that are (a) commonly reported among adolescents in distress (e.g., Hovens, Cantwell, & Kiriakos, 1994; Roberts, Roberts, & Chan, 2009; Roberts, Roberts, & Xing, 2007), and (b) are recurrently included in well-established measures of internalizing and externalizing problems (Achenbach & Rescorla, 2001; Beck et al., 2005; Huizinga & Elliot, 1986; Radloff, 1977; Reynolds & Kamphaus, 1992). Examples of regularly referenced symptoms include feelings of sadness, nervousness, and stealing, respectively, for depression, anxiety, and rule-breaking, and drinking to intoxication for substance use. Having culled the symptoms most commonly documented as signaling each of the four problem areas of interest for this new measure, the top five were identified, and brief statements were composed to capture each (see Method for more details).

To document the psychometric properties of the WBI in this study, analyses were done on both reliability as well as different types of validity. With regard to reliability, alpha coefficients of internal consistency were examined for all subscale scores. These were computed separately among boys and girls.

As a primary test of validity, subscale scores on the WBI were compared against those on the YSR—which, as previously noted, is widely regarded as the gold standard of assessments of adolescent symptoms. Simple correlations were examined to assess convergent and discriminant validity, with expectations that WBI subscale scores would show strong links with the conceptually parallel dimensions on the YSR, and lower correlations with those conceptually distinct (e.g., WBI Depression and Anxiety would both have stronger links with YSR Anxious–Depressed, than with YSR Rule-Breaking).

In a second set of analyses on validity, associations were examined between WBI (and YSR) subscales and other aspects of adolescents' psychosocial adjustment with which conceptually, they should be related; the hope was that the magnitude of associations for the subscales of the WBI would be at least comparable to (if not greater than) those of the YSR. In these analyses, the

central focus here was on dimensions of relationships, which we know are critical in relation to exacerbating both internalizing and externalizing symptoms (Luthar & Eisenberg, 2017). Specifically, links were examined with feelings of alienation from both parents as well as from teachers, feelings of being bullied or victimized at school, and overall relationship stress; each of these is conceptually linked with both internalizing and externalizing problems (for reviews, see Flett, 2018; National Academies of Science, Engineering, and Medicine [NASEM], 2019a, 2019b). In addition, we examined teens' reports of discipline at school, that is, the degree to which they felt that students who broke rules were treated fairly, with the assumption that those high on rule breaking (or other symptoms) would be less likely to see school rules as generally fair and appropriate.

In a third set of validity analyses, the focus was on the degree to which the WBI and YSR each classified youth as having symptom levels surpassing the normal range, that is, greater than 2 *SDs* and 1.5 *SDs* from the sample mean, respectively labeled "much above average" and "above average" on the YSR. The goal here was to identify percentage of agreement across the two measures, as well as the percentage of WBI "false positives" and "false negatives" vis-à-vis classifications by the YSR. The percentage of "false positives" reflected situations in which the WBI might classify a student as falling above cutoffs on symptoms, but the YSR did not. Conversely, the percentage of "false negatives" would reflect situations in which the WBI did not classify a student as being above cutoffs, but the YSR did.

Isolation at School

As a further gauge of overall student well-being—apart from symptoms—the WBI contains five items pertaining to students' sense of alienation or rejection at school as opposed to belonging and acceptance; information on this construct could also be valuable for school administrators. As we now know well, resilience rests centrally on relationships (Luthar & Eisenberg, 2017; NASEM, 2019a) and school-based relationships can strongly affect students' well-being (e.g., Millings et al., 2012; Vaz et al., 2014). Just as the quality of relationships with parents is critical in determining how well children negotiate the ongoing challenges of adolescence, research has demonstrated the high potential for relationships at school to move adjustment trajectories toward more positive (or negative) directions (for a review, see Domitrovich, Durlak, Staley, & Weissberg, 2017).

Another reason for school administrators to measure isolation at school would be to evaluate the success of integrating new sets of students, especially at grade levels that represent major transition points. For example, middle schools often bring together, in the sixth grade, elementary school students from a number of feeder schools, leading to the formation of new groups of friends and the possible isolation of some, as peer groups coalesce. Similarly, many high schools include only Grades 9 through 12; it can be helpful to keep track of the degree to which incoming 9th graders feel a sense of belonging to the institution. Routine assessments at such transitional points can also be critical for identifying any subgroups who might need additional support integrating into the school, such as international students joining a new school, even as they are transitioning to life in a new country.

Along with the four symptom domains, therefore, this study also entailed examination of the psychometric properties of the five-item WBI scale on Isolation at School. As with symptom scales, alpha coefficients were computed separately for girls and boys to document internal consistency. To assess validity of this scale, of central interest were associations with measures of alienation from both adults and peers at school, that is, teacher alienation and peer victimization.

Summary

To summarize, goals in this study were to examine the reliability and validity of the WBI as a useful potential measure of well-being of students in school-wide assessments. Specific goals were to (a) evaluate the reliability or internal consistency of each subscale—two on internalizing symptoms (Depression and Anxiety), two on externalizing symptoms (Rule-Breaking and Substance Use), and a separate scale on Isolation at School; (b) validate the internal structure of distinct symptom subscales, by empirically demonstrating the conceptualized four-factor structure of the two internalizing and two externalizing symptoms assessed; (c) examine the convergent and discriminant validity of WBI symptom subscale scores, via correlations with YSR subscales; (d) assess criterion-related validity by examining associations of the WBI subscales with conceptually related, established measures; and (e) measure concurrent validity, that is, concordance in the percentage of youth falling above clinical cutoffs on the WBI and on the YSR.

Method

Participants and Procedures

Data were obtained from 2,444 high school adolescents, Grades 9 ($n = 628$), 10 ($n = 678$), 11 ($n = 635$), and 12 ($n = 486$) and postgraduates ($n = 17$). Of the sample, 49.8% were male ($n = 1217$) and 50.2% were female ($n = 1227$). Participants were from two high school samples, one independent (which some refer to as "private") and one public, respectively from the Northeast and Southwest regions of the United States. Students described themselves as primarily Caucasian (61.5%), with other ethnicities represented as follows: African American/Black (4.4%), Latinx/Hispanic (15.5%), Asian/Asian American/Pacific Islander (8.2%), American Indian/Native American (1.1%), Middle Eastern (0.6%), and Biracial/Multiracial/Other (9.8%). Participants' reports indicated that 72.8% of the parents were married, with about half having graduated from college (53% of mothers and 50% of fathers) and a majority working full-time jobs (61% of mothers and 83% of fathers).

As part of their ongoing work to foster positive youth development, school officials administered a survey on well-being and adjustment in the Spring semester of 2019. Parents were informed about the nature of the survey, given the option to decline their children's participation, and assured of the confidentiality and anonymity of the data. Adolescents completed the questionnaires in their classrooms during regularly scheduled class time, using computer-based surveys. Only 8% of the student body across both schools were either denied parent consent to participate in the study or were absent on the day of data collection. A total of 2,546 students completed the survey with a rejection rate of 4% due to

incomplete data, resulting in a final sample of 2,444 adolescents. The present study was granted “exempt” status by the IRB committee at Columbia University’s Teachers College, Protocol Number 20–161, as it involved analyses of preexisting, anonymous data.

Measures

Measures used in this study were part of a larger battery of instruments assessing students’ well-being and the quality of their relationships with parents, peers, and adults at school. The order of questionnaires was the same in all administrations, beginning with demographic data, and measures with a negative valence (e.g., symptoms or difficulties in relationships) interspersed with those of a positive valence (e.g., perceived support across different relationships). The measures were all psychometrically sound; alpha reliability coefficients, shown in Table 1, indicated acceptable levels of internal consistency (e.g., $\alpha \geq .70$; Nunnally & Bernstein, 1994).

Well-Being Index (WBI)

The WBI was developed by the third author, drawing upon her background in psychology and expertise with school-based assessments (Ebbert, Kumar, & Luthar, 2019; Kumar, 2019; Luthar & Kumar, 2018; Luthar et al., 2019, 2020). Three five-item subscales were drafted to capture problem areas common among adolescents (depression, anxiety, and rule-breaking; see below for details), plus one subscale that would assess feelings of isolation at school. As is common for the creation of new measures in psychology (see DeVellis, 2016), items were created by first generating statements that paraphrased each category of symptoms to be captured, rely-

ing on existing, relevant theoretical and empirical literatures. After refining the items to reflect specific and age-appropriate wording, the initial pool of items was reviewed by other experts as is recommended (DeVellis, 2016); each expert had experience in developmental psychopathology research and clinical practice with adolescents (the first and second authors). Collectively, this team then finalized WBI subscale items, with a goal of balancing both thoroughness and brevity in representing distinct, yet conceptually related symptoms, and ensuring face validity.

The three newly created symptom subscales included Depression (e.g., “I am sad or depressed”), Anxiety (e.g., “I worry or obsess”), and Rule-Breaking (e.g., “I cheat on exams or tests”). For each of these, subjects were asked to indicate the extent to which the items were true for them within the past 6 months on a 5-point scale (0 = *never*, 1 = *rarely*, 2 = *sometimes*, 3 = *often*, and 4 = *very often*). To assess the fourth mental health dimension, Substance Use, questions from the Monitoring the Future study (Johnston et al., 2014) asked about substance use behaviors most common among youth—drinking alcohol, getting drunk, using marijuana, smoking cigarettes, and vaping. The stem for these questions was, “During the last 30 days, on how many occasions (if any) have you . . .” and sample items include “smoked cigarettes” and “drank alcohol (including beer, wine, and liquor)—more than just a few sips.” Ratings were rescaled from a 7-point to 5-point scale (0 = *never* and 4 = *40 or more times*) to match the other WBI subscales. The reliability and validity of this type of self-report on substance use have been amply documented (Johnston et al., 2014; Wallace & Bachman, 1991). Finally, the supplementary Isolation at School subscale also contained five items (e.g., “At my school, I feel isolated or like I don’t belong”). These items too were rated on how true they were for the individual

Table 1
Internal Consistency Coefficients of Measures and Descriptive Statistics of Variables

Measures	Boys, α	Girls, α	Boys		Girls		<i>F</i> gender	η^2
			<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
WBI subscales								
Depression	.82	.84	5.60	4.33	7.50	4.48	113.75***	.05
Anxiety	.82	.82	5.85	4.33	8.95	4.71	288.23***	.11
Rule-breaking	.78	.78	4.04	3.66	3.35	3.30	24.17***	.01
Substance use	.83	.76	1.56	3.29	1.30	2.63	4.47*	0
Isolation at school	.74	.73	3.98	4.01	5.39	4.19	72.29***	.03
YSR subscales ^a								
Anxious–depressed raw score	.95	.94	8.06	7.97	10.77	8.26	66.79***	.03
Anxious–depressed <i>T</i> score	—	—	63.43	14.91	64.72	15.28		
Somatic complaints raw score	.94	.92	5.69	5.80	7.32	5.98	45.76***	.02
Somatic complaints <i>T</i> score	—	—	63.32	14.40	63.55	14.08		
Rule-breaking raw score	.95	.95	8.85	8.11	8.03	7.57	6.49*	0
Rule-breaking <i>T</i> score	—	—	62.96	13.79	61.66	12.51		
Validating variables								
Mom alienation	.77	.77	8.21	3.62	8.76	3.74	12.82***	.01
Dad alienation	.80	.82	8.33	3.84	8.90	4.07	11.65**	.01
School: Fairness of discipline	.86	.79	2.87	1.04	3.02	0.87	12.81***	.01
School: Teacher alienation	.92	.92	1.83	1.02	1.97	1.03	10.87**	.01
Peer victimization	.92	.86	4.50	2.17	4.59	1.72	1.29	0
Relationship stress	.81	.73	1.91	0.84	2.14	0.79	43.44***	.02

Note. WBI = Well-Being Index; YSR = Youth Self-Report. *n* = 1,217 for boys and 1,227 for girls.

^a For the YSR, values are reported for both raw and *T* scores; the latter indicate that this 2019 sample had higher mean *T* scores and *SD*s (*T* > 60; *SD*s > 12) than 2001 norms (*T* = 50; *SD* = 10).

* *p* < .05. ** *p* < .01. *** *p* < .001.

within the past 6 months, on a 5-point scale (0 = *never*, 1 = *rarely*, 2 = *sometimes*, 3 = *often*, and 4 = *very often*).

Alpha coefficients of all WBI subscales are shown in Table 1. Among boys and girls respectively, values were as follows: Depression, .82 and .84; Anxiety, .82 and .82; Rule-Breaking, .78 and .78; Substance Use, .83 and .76; and Isolation at School, .74 and .73.

When the WBI was administered within the school-based assessment battery, the five subscales were presented in the same order that they are described here, and the order of all items was fixed, as is true when administering the Youth Self Report described in the section that follows.

Measures Used to Validate the WBI Subscales

Symptoms: The Youth Self-Report (YSR). The YSR (Achenbach & Rescorla, 2001) is a 112-item index designed to measure internalizing and externalizing symptoms across several subscales. Participants are asked to indicate frequencies of experiencing these within the past six months on a 3-point scale (0 = *never*, 1 = *sometimes*, 2 = *often*). Although the entire YSR was included with standard administration, in this study, we examined data on two internalizing subscales directly relevant to WBI subscales, that is, Anxious–Depressed and Somatic Complaints, and one externalizing subscale, Rule-Breaking. The Anxious–Depressed scale consists of 13 items, which describe symptoms of feeling anxious (e.g., “I worry a lot”) and depressed (e.g., “I feel worthless or inferior”). The Somatic Complaints scale consists of 10 items, which describe physical symptoms of anxiety or depression (e.g., “I feel overtired without good reason”). Finally, the Rule-Breaking subscale consists of 15 items, which describe delinquent behaviors (e.g., “I break rules at home, school, and elsewhere”). In the present study, reliability coefficients among boys and girls respectively were as follows: Anxious–Depressed, .95 and .94; Somatic Complaints, .82 and .94; and Rule-Breaking, .95 and .95 (see Table 1).

Conceptually related constructs. Adolescents’ feelings of alienation from mothers and fathers were assessed with the Alienation subscale of the Short Form of the Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987). The Inventory of Parent and Peer Attachment Short Form consisted of 24 items with 12 pertaining to each parent, each rated on a 5-point scale from 1 (*almost never or never true*) to 5 (*almost always or always true*). The Alienation scale consisted of eight items (four for each parent) that assessed the youth’s feelings of anger, isolation, and mistrust in relating to each parent (e.g., “Talking over my problems with my mother/father makes me feel ashamed or foolish,” “I feel angry with my mother/father”), with reliability coefficients ranging from .77 to .82.

Also considered were dimensions from the School Climate and Connectedness Survey (American Institutes for Research, 2011), which evaluates student attitudes toward their school and dimensions of connectedness. The following two school climate subscales were included with three items each: Fairness of Discipline, for example, “When students break rules, they are treated fairly,” and Teacher Alienation, for example, “My teacher has made me feel inadequate or inferior to others.” For each dimension of school climate assessed, participants responded to items on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). In the present

study, internal consistencies were well above 0.70, ranging from .79 to .94 (see Table 1).

Peer victimization was measured by the Revised Peer Experiences Questionnaire (Prinstein, Boergers, & Vernberg, 2001) which taps into overt, relational, and reputational victimization rated on a 5-point scale from 1 (*never*) to 5 (*a few times a week*). The Revised Peer Experiences Questionnaire has demonstrated good validity and reliability (Prinstein et al., 2001), and in this sample, alpha coefficients ranged from .86 to .92. Finally, students were assessed on overall stress from relationships, responding to this prompt: “Please indicate how much stress the people in the following relationships cause you (e.g., parents, teachers, coaches, friends in general, friends due to competition, and significant others). For each relationship, students rated their response on a 5-point scale from 1 (*not at all*) to 5 (*a great deal*) with alpha coefficients ranging from .73 to .81.

Statistical Analyses

Analyses for this study were conducted using SPSS software (IBM SPSS Statistics, Version 25.0) and Mplus (Version 7.11; Muthén & Muthén, 2013). To test the equality of correlation coefficients specifically, an interactive, online calculator was used (Lee & Preacher, 2013).

Results

Descriptive Data

Table 1 presents means and standard deviations on all variables in this study, separately for boys and girls. As would be expected, girls had significantly higher levels of both WBI internalizing symptoms, whereas boys had substantially higher externalizing problems, and slightly higher substance use. Similar patterns were seen on YSR subscales. On all the validating indices—negative aspects of relationships—girls reported higher levels than boys.

Internal Structure: Factorial Validity of WBI Symptom Subscales

After randomly splitting the sample in half, an exploratory factor analysis (EFA) was conducted on one half of the data to identify the underlying factor structure of items in the two sets each of internalizing versus externalizing domains, Depression and Anxiety, versus Rule-Breaking and Substance Use. Analyses used maximum likelihood, a common model-fitting method that estimates factor loadings and unique variances, and Crawford-Ferguson- or CF-Quartimax rotation. The latter is an oblique rotation method that uses the overall variance of the squared factor structure, based on the assumption that the subscales are correlated. Results of the EFA model indicated the four conceptually distinct subscales of symptoms (see Table 2); these findings provided the basis for specifying a confirmatory factor analysis (CFA) model that was fit to the other half of the data.

Evaluating Model Fit

To determine whether the specifications of the estimated CFA model were consistent with the data, the goodness of fit of the

Table 2

Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) Using Maximum Likelihood Estimation and (Crawford-Ferguson) CF-Quartimax Rotation

WBI subscale	Exploratory factor analyses: Factor loadings								Confirmatory factor analyses: Factor loadings	
	Factor 1: Depression		Factor 2: Anxiety		Factor 3: Rule-Breaking		Factor 4: Substance Use			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Low life enjoyment	.69	.74	.08	−.02	−.01	.06	0	−.05	.73	.75
Low self-worth	.43	.59	.37	.24	−.01	.05	0	−.08	.75	.70
Suicidal ideation	.79	.81	−.09	−.13	.07	.01	.01	.07	.69	.70
Sad	.71	.72	.18	.19	−.02	−.05	.04	.05	.86	.85
Tired	.39	.28	.25	.28	.06	.16	.03	−.03	.56	.61
Anxious	.03	.03	.86	.85	−.03	−.07	.03	.07	.83	.85
Nervous	.04	−.02	.80	.82	.02	.04	−.06	−.05	.81	.82
Worry	.01	.05	.68	.63	.11	.12	.02	−.02	.70	.72
Headaches	.24	.14	.27	.28	.05	.14	.09	.04	.44	.48
Nausea	.23	.13	.36	.45	.18	.11	.05	.06	.64	.65
Breaks school rules	−.09	−.01	.06	−.01	.72	.62	.06	.08	.65	.72
Breaks parents' rules	.00	.02	.00	−.02	.74	.72	.09	.06	.81	.82
Cheats	.08	−.05	−.11	−.01	.52	.60	−.05	−.03	.59	.55
Lies	−.01	.04	.08	.09	.71	.63	−.06	−.08	.64	.70
Steals	.18	.07	−.08	0	.56	.45	−.07	.11	.51	.54
Cigarettes	.07	−.04	.02	.11	.06	−.02	.29	.38	.47	.42
Alcohol	−.02	−.06	.02	0	.02	.11	.80	.74	.80	.83
Drunk	−.05	0	.03	.03	−.02	−.07	.91	.90	.87	.89
Marijuana	.14	.10	−.07	−.05	.02	.05	.63	.62	.64	.65
Vaping	.20	.05	−.13	0	.13	.10	.47	.58	.66	.59

Note. WBI = Well-Being Index. $n = 604$ males and 617 females for EFA sample; $n = 623$ males and 610 females for CFA sample. Boldface indicates items loading onto the designated factor.

model was evaluated. Using combinational rules based on a two-index presentation strategy (Hu & Bentler, 1999), the standardized root mean square residual (SRMR) and the root mean square error of approximation (RMSEA; Steiger, 1990) were considered. A model with relatively good fit would be evidenced by a SRMR value of close to .08 (or less) and a RMSEA value of close to .06 (or less; Hu & Bentler, 1999). RMSEA values close to .08 indicate fair fit (Browne & Cudeck, 1993).

In the present study, a review of the related goodness-of-fit indexes revealed relatively good-fitting EFA models as indicated by the following evaluative criteria for boys: SRMR = .04; and RMSEA = .08. For girls, another good-fitting model was indicated by the following evaluative criteria: SRMR = .04; and RMSEA = .07. Additionally, combinational rules based on SRMR and RMSEA fit indexes revealed relatively good-fitting CFA models as indicated by the following evaluative criteria for boys and girls, respectively: SRMR = .07 and .06; and RMSEA = .08 and .07. CFA factor loadings are shown in Table 2.

Convergent, Discriminant, and Criterion-Related Validity

Table 3 presents simple correlations across all variables in the study and shows that WBI scores were significantly related to conceptually related YSR variables. Coefficients for the WBI Depression in relation to YSR Anxious–Depressed were .43 and .60 for boys and girls, respectively, and those for the WBI Anxiety and YSR Anxious–Depressed were .43 and .56. Correlations between WBI Rule-Breaking and the YSR Rule-Breaking were .36 and .40 for boys and girls, respectively. The WBI Isolation at

School subscale was significantly related to school climate subscales from preexisting measures. Considering absolute values, correlations among girls ranged from .22 to .44, and those for boys ranged from .20 to .40 (please see Table 3 for more details).

Table 3 also shows expected associations between WBI subscales and conceptually related constructs. WBI Depression and Anxiety subscales were significantly correlated with alienation from mothers, with coefficients of .38 and .33, respectively, for boys, and .45 and .34 for girls. Parallel values for alienation from fathers were .36 and .33 for boys and .43 and .33 for girls. Similarly, correlations with relationship stress were significant; for boys and girls, respectively, values for WBI Depression were .36 and .41 and for WBI Anxiety, .34 and .37. In relation to Peer victimization, the values for the two internalizing subscales, respectively, were .35 and .29 for boys, and .39 and .35 for girls. Finally, WBI Rule-Breaking had pronounced associations with Substance use, with correlation coefficients of .42 and .41 for boys and girls, respectively; it was also significantly related to all relationship variables.

To examine convergent and discriminant validity in greater depth, we compared the magnitude of coefficients where the WBI subscale was conceptually (a) similar to the YSR subscale versus (b) dissimilar, using asymptotic z tests (Lee & Preacher, 2013; Steiger, 1980). Results are shown in Table 4, with values involving conceptually similar pairs shown first in boldface, followed by those involving dissimilar pairs. For example, coefficients for WBI Depression and YSR Anxious–Depressed/YSR-Rule-Breaking were .43/.28 and .60/.31, for boys and girls, respectively. As shown in Table 4, all six comparisons showed that the coefficients for WBI scores in

Table 3
Correlations Among Well-Being Index (WBI), Youth Self-Report (YSR)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. WBI Depression	—	.73**	.41**	.21**	.67**	.60**	.51**	.31**	.45**	.43**	-.21**	.28**	.39**	.41**
2. WBI Anxiety	.71**	—	.33**	.17**	.64**	.56**	.54**	.24**	.34**	.33**	-.15**	.30**	.35**	.37**
3. WBI Rule-breaking	.42**	.37**	—	.41**	.37**	.24**	.26**	.40**	.38**	.31**	-.23**	.21**	.27**	.32**
4. WBI Substance use	.24**	.15**	.42**	—	.20**	.11**	.19**	.37**	.22**	.20**	-.15**	.10**	.27**	.20**
5. WBI Isolation at school	.66**	.59**	.42**	.10**	—	.52**	.41**	.26**	.34**	.31**	-.22**	.39**	.44**	.41**
6. YSR Anxious–depressed	.43**	.43**	.14**	.20**	.38**	—	.82**	.75**	.33**	.28**	0	.16**	.28**	.38**
7. YSR Somatic	.34**	.38**	.16**	.24**	.26**	.86**	—	.81**	.27**	.23**	-.03	.16**	.29**	.37**
8. YSR Rule-breaking	.28**	.23**	.36**	.44**	.23**	.80**	.76**	—	.25**	.20**	-.02	.06**	.24**	.31**
9. Mom alienation	.38**	.33**	.27**	.18**	.34**	.31**	.26**	.25**	—	.44**	-.14**	.22**	.27**	.38**
10. Dad alienation	.36**	.33**	.32**	.23**	.35**	.28**	.25**	.26**	.51**	—	-.23**	.21**	.27**	.35**
11. School: Fairness discipline	-.10**	-.01	-.25**	-.19**	-.20**	.06**	.04	-.03	-.12**	-.12**	—	-.25**	-.19**	-.17**
12. School: Teacher alienation	.28**	.25**	.28**	.23**	.35**	.16**	.17**	.17**	.22**	.26**	-.15**	—	.39**	.34**
13. Peer victimization	.35**	.29**	.29**	.27**	.40**	.31**	.27**	.26**	.30**	.27**	-.12**	.52**	—	.41**
14. Relationship stress	.36**	.34**	.22**	.21**	.37**	.35**	.29**	.29**	.32**	.34**	-.05	.37**	.50**	—

Note. Correlation coefficients for girls are above the diagonal; those for boys are below the diagonal. Boldface and italics indicate WBI and YSR subscales, respectively, correlated with conceptually related constructs.

* $p < .05$. ** $p < .01$.

relation to similar YSR ones were significantly higher than values involving conceptually dissimilar ones, at $p < .001$.

WBI Versus YSR Symptom Subscales in Relation to Validating Predictors

Correlation coefficients. Table 5 shows associations between all validating predictor variables and (a) the three WBI symptom subscales versus (b) the parallel YSR subscales. Again, the pairs of correlation coefficients were compared to determine if they differed in magnitude. For example, in relation to Mom alienation, correlations compared included WBI Depression versus YSR Anxious–Depressed, which were .38 versus .31 for boys, and .45 versus .33 for girls.

Results collectively indicated that despite the relative brevity of WBI subscales, this had not led to lower overall magnitude of correlations, relative to those of the YSR, with validating predictors. In fact, the magnitude of associations was generally comparable and, in some instances, larger for the WBI. As shown in Table 5, of the 36 comparisons (18×2 , for boys and girls), 23 of them (64%) showed that correlations for WBI subscales were significantly larger, in the expected direction, than those for their YSR analogues. In an additional 9 cases, WBI values were higher, but these differences were not statistically significant. There were only 4 instances where the coefficients for WBI were lower than

those for YSR, with differences statistically significant in just one of the cases. It should be noted that in the cases involving perceived Fairness of Discipline, which conceptually, should be inversely correlated with adolescents' symptoms, two correlation coefficients for WBI were lower than those for YSR in absolute value (see Table 5 note). At the same time, the valence of these associations was in the expected negative direction for WBI but not the YSR, which is why these comparisons were counted as favorable for the former.

R^2 values in regressions. As another simple gauge of overall validity as symptom measures, regression analyses were conducted using all six of the conceptually related validating variables as predictors, to ascertain the total variance explained in the symptom subscale scores. Results of these regressions, again, yielded no evidence that any of the brief WBI subscales had lower magnitude of associations with predictors collectively as compared to the longer YSR subscales; in fact, variance accounted for was greater in predicting to WBI subscales. Specifically, total R^2 values were as follows for pairs of outcome variables from the two measures: WBI Depression versus YSR Anxious–Depressed, $R^2 = .25$ and .21 (boys), .36 and .21 (girls); WBI Anxiety versus YSR Anxious–Depressed, $R^2 = .23$ and .21 (boys), .25 and .21 (girls); WBI Rule-Breaking versus YSR-Rule-Breaking, .22 and .13 (boys), .23 and .13 (girls).

Table 4
Comparisons of Correlation Coefficients: Well-Being Index (WBI) Subscales in Relation to Conceptually Similar/ Not Similar Youth Self-Report (YSR) Subscales

WBI subscale	WBI subscale/YSR subscale	Conceptually similar/not similar subscales	
		Boys r	Girls r
Depression	Anxious–depressed/Rule-breaking	.43/.28***	.60/.31***
Anxiety	Anxious–depressed/Rule-breaking	.43/.23***	.56/.24***
Rule-breaking	Rule-breaking/Anxious–depressed	.36/.14***	.40/.24***

*** $p < .001$.

Table 5
Comparisons of Correlation Coefficients: Predictors in Relation to Conceptually Similar Well-Being Index (WBI)/ Youth Self-Report (YSR) Subscales

Predictor	Correlations between		WBI/YSR	
	WBI subscale	YSR subscale	Boys <i>r</i>	Girls <i>r</i>
Mom alienation	Depression	Anxious–depressed	.38/.31**	.45/.33***
Dad alienation	Depression	Anxious–depressed	.36/.28**	.43/.28***
Teacher alienation	Depression	Anxious–depressed	.28/.16***	.28/.16***
Fairness discipline	Depression	Anxious–depressed	–.10 ^a /.06***	–.21 ^a /.00***
Peer victimization	Depression	Anxious–depressed	.35/.31	.39/.28***
Relationship stress	Depression	Anxious–depressed	.36/.35	.41/.38
Mom alienation	Anxiety	Anxious–depressed	.33/.31	.34/.33
Dad alienation	Anxiety	Anxious–depressed	.33/.28*	.33/.28*
Fairness discipline	Anxiety	Anxious–depressed	–.01 ^a /.06**	–.15 ^a /.00***
Teacher alienation	Anxiety	Anxious–depressed	.25/.16**	.30/.16***
Peer victimization	Anxiety	Anxious–depressed	.29/.31	.35/.28**
Relationship stress	Anxiety	Anxious–depressed	.34/.35	.37/.38
Mom alienation	Rule-breaking	Rule-breaking	.27/.25	.38/.25***
Dad alienation	Rule-breaking	Rule-breaking	.32/.26**	.31/.20***
Fairness discipline	Rule-breaking	Rule-breaking	–.25/–.03***	–.23 ^a /–.02***
Teacher alienation	Rule-breaking	Rule-breaking	.28/.17***	.21/.06***
Peer victimization	Rule-breaking	Rule-breaking	.29/.26	.27/.24
Relationship stress	Rule-breaking	Rule-breaking	.22/.29*	.32/.31

Note. Italics indicates instances where *r* for WBI subscale < *r* for YSR subscale.

^a As perceived fairness of discipline is conceptually expected to be inversely correlated with symptoms, these comparisons were favorable for WBI subscales.

* *p* < .05. ** *p* < .01. *** *p* < .001.

To ascertain whether the magnitudes of variance explained (R^2) were significantly different when outcome variables were based on the WBI versus the YSR measures, a repeated measures model (general linear model procedure) was used (see Wheeler, 2017). For example, the first pair of R^2 values compared, with WBI Depression versus YSR Anxious–Depressed as outcomes, was .25 versus .21 for boys. Across all six pairs of R^2 coefficient delineated in the previous paragraph, values were significantly higher for outcomes involving the WBI, at $p < .001$.

Concurrent Validity: Classification of Youth Above Clinical Cutoffs

The percentage of students falling above clinical cutoffs on the WBI and on the YSR each were examined, using gender-specific norms for each; results are presented in Table 6. When the WBI Depression classifications were compared with those on the YSR Anxious–Depressed scale, instances where both measures classified students in the clinically significant range (over 2 *SDs* from the mean), were 69% and 72% for boys and girls respectively. Parallel values in classifying students in the range of borderline significance (above 1.5 *SDs* from the mean) were 67% and 65% for boys and girls respectively. Similarly, when WBI Anxiety and YSR Anxious–Depressed classifications were compared, agreement above 2 *SDs* was 70% for both genders, while agreement on being above 1.5 *SDs* was 66% and 63% for boys and girls respectively. For Rule-Breaking, the four values for matching classifications were 70% and 74% versus 68% and 73%.

Disagreements in classification occurred almost entirely because the YSR identified more students as being above clinical cutoffs than did the WBI, rather than the reverse. In classifying both clinically significant and borderline scores, between 23% and 36% of instances

involved a negative classification by the WBI but a positive one by the YSR. By contrast, “false positives” based on the WBI (not indicated by the YSR) were very rare, ranging from zero to 4%.

Discussion

The present results indicate the promise of a brief measure for school-based assessments of youth mental health, the WBI (Kumar, 2019). The measure is applicable to teens from various sociodemographic backgrounds, as it captures major internalizing and externalizing symptoms that generally occur during the adolescent years. Examination of psychometric properties showed good internal consistency of all scales as well as high levels of validity. From a pragmatic standpoint, given an administration time of approximately 10 min, the WBI can be administered even on a monthly basis (e.g., when a school may have experienced traumas, or to periodically track the value of a given intervention program for targeted subgroups). At a more macro level, annual administration of this short measure would allow administrators to keep track of the overall well-being of their students, much as they keep track of scores on standardized tests or passing percentages on achievement tests. In discussions that follow, major findings on the WBI’s psychometric properties are summarized first, followed by an appraisal of its applications in school-based assessments tied to prevention efforts.

WBI as a Measure of Symptoms: Psychometric Properties

Results of this study indicated good psychometric properties of the WBI as a measure of adolescents’ internalizing and externalizing symptoms. With regard to reliability, internal consistency of

Table 6
Concordance Among Well-Being Index (WBI) and Youth Self-Report (YSR) Subscales Using WBI Normative Sample Cutoffs

Subscales compared	Clinically significant or "much above average" (2 SD)		Borderline or "above average" (1.5 SD)	
	Boys	Girls	Boys	Girls
YSR Anxious–depressed				
WBI Depression				
Agreement on both	69%	72%	67%	65%
WBI no/YSR yes	30%	27%	31%	34%
WBI yes/YSR no	1%	1%	2%	1%
WBI Anxiety				
Agreement on both	70%	70%	66%	63%
WBI no/YSR yes	29%	30%	33%	36%
WBI yes/YSR no	1%	0%	1%	1%
YSR Rule-breaking				
WBI Rule-breaking				
Agreement on both	70%	74%	68%	73%
WBI no/YSR yes	27%	23%	28%	25%
WBI yes/YSR no	3%	3%	4%	2%

Note. $n = 1,217$ for boys and 1,227 for girls. Cutoffs of 2 and 1.5 SDs for the YSR were based on published norms; for the WBI, these two cutoffs were based on means and standard deviations within this sample (see Table 1). Bolded values indicate the percentage of agreement between the YSR and WBI on classification of students' scoring above 2 SD and 1.5 SD.

the four symptom subscales—Depression, Anxiety, Rule-Breaking and Substance Use—was acceptable among both boys and girls. The eight values ranged from .72 to .84, with a median of .82; these values fall well above the range that is considered satisfactory ($\alpha \geq .70$; Nunnally & Bernstein, 1994).

In terms of the distinctiveness of the symptom areas measured, factor analyses supported a four-factor model. As they had been conceptualized, the 20 items did map on the two internalizing subscales of Depression and Anxiety and two externalizing subscales of Rule-Breaking and Substance Use. An evaluation of the goodness of fit model revealed an exceptionally well-fitting model.

WBI subscales also showed strong levels of convergent and discriminant validity. With regard to the former, one would expect stronger links between WBI subscales of internalizing symptoms with YSR scores also of internalizing problems, as opposed to YSR externalizing scores. In fact, correlations for both WBI Depression and WBI Anxiety with the YSR Anxious–Depressed subscale were higher than coefficients of each of these with YSR Rule-Breaking (1.5–2 times as high). All comparisons were statistically significant.

Similarly, when considering the magnitude of correlations with conceptually linked constructs—aspects of relationships with parents, peers, and teachers—WBI subscales' correlations were clearly at least equivalent to those for YSR subscales, if not slightly higher, on the whole. Specifically, of 36 comparisons conducted, differences were significantly higher for the WBI in 64% of cases, and for the YSR in less than 3%. Furthermore, when all sets of predictors were entered into regression analyses, the total variance explained was significantly greater when outcomes were symptoms measured by the WBI, as opposed to based on the YSR. In sum, despite the brevity of WBI subscales relative to YSR

(five items each as opposed to 10–15 items), findings of this study did not suggest any relative deficits in validity of measurement.

There was also generally good agreement in classifying youth as showing clinically significant levels of symptoms, as measured by the WBI versus the YSR; this was true even though descriptors of symptoms were similar but not identical. In these analyses, classification based on the WBI Depression and Anxiety subscales were each compared against classification via the single YSR subscale that subsumed both these dimensions, Anxious–Depressed. Similarly, the WBI separately measures Rule-Breaking and Substance Use whereas the YSR Rule-Breaking subscale includes acts related to conduct disturbances as well as to substance use. These caveats notwithstanding, levels of agreement in classifying youth in the clinically significant range ("Much above average" or 2 SDs from the mean) ranged from 69% to 74%, with a median of 70%.

Discrepancies in classifying students above clinical cutoffs almost all occurred because of "false negative," wherein analyses using the YSR classified more students at the extremes than did analyses using the WBI. One potential explanation for the difference in classification might be that levels of clinically significant symptoms have shifted over the last couple of decades in the United States. Norms on the YSR are based in assessments done around the year 2000 (Achenbach & Rescorla, 2001), before the creation of social media and tragedies such as 9/11, and multiple reports have shown overall increases in adolescent distress over time (APA, 2018; NASEM, 2019a; Twenge et al., 2019). To the degree that teens as a group are more troubled overall, this would imply a higher overall mean on any given scale and commensurately, smaller numbers of youth falling under the "extremes" of +2 SDs. To illustrate, if the population mean of adolescents' symptoms on a given measure increased from 50 to 60 over the decades with SDs of 10 in both cases, individuals with scores of 79 would be below clinical cutoffs using 2019 norms on this measure, but well above clinical cutoffs using norms from the past. This suggestion is in fact supported by findings, in this study, of mean T scores all greater than 60 among both boys and girls and across all three YSR subscales assessed. (In essence, this implies that a standardized score of 75 would connote approximately +1.5 SDs on the WBI (this sample's means of about 60 and SDs of 15), but equivalent to a YSR T score of +2 SDs, given YSR's mean T score of 50 and SD of 10).

An additional possibility that must be considered, in relation to inferences about false negative classifications on the WBI versus YSR, is that there were differences in samples that were used in defining normative values on the measures. The original YSR norms were based on nonreferred youth (Achenbach & Rescorla, 2001). By contrast, norms created for the WBI were based on all students at the schools sampled, which presumably included some children who had been referred for professional help.

In future research, administration of the WBI to additional samples of students will be critical in indicating values that truly approximate the current "population" means and standard deviations. By the end of 2019, WBI data had been obtained from almost 15,000 youth across the United States (these additional samples were not assessed on the YSR, however, so are not discussed in the present article). Examination of the larger samples will also permit more fine-grained analyses of clinical cutoffs separately by gender, grade level, and ethnicity. However, before moving to any such large scale administration of the WBI, a

critical prerequisite has to be work such as that reported on in this study: Establishing good psychometric properties of this as a stand-alone instrument, validated against the widely used, gold standard measure (the YSR), and documenting strong relationships with other conceptually linked measures.

Applying the WBI Toward Prevention of Youth Psychopathology

Just as nations have a simple “happiness index,” we believe that it is critical that schools have a simple WBI of their overall student body. As noted earlier, adolescents are increasingly experiencing mental health difficulties (APA, 2018). Today’s youth who are in the range of 15–21 years, called Gen Z, are significantly more likely than prior generations to report that their mental health is fair or poor, with 27% indicating this is true for them. By contrast, ratings of fair or poor mental health were given by 15% of Millennials and 13% of Gen Xers, and only seven and five percent, respectively, of Boomers and older adults.

From a prevention standpoint, these data indicate that it would be useful to schools to be able to regularly track where their student bodies stand on psychosocial adjustment, just as they do with standardized test scores. In addition, administering the WBI measure could allow administrators to see which symptom areas might need enhanced attention within their own schools, as impressionistic evidence is not always borne out by the data. High school teachers are often more aware of externalizing, acting-out behaviors, for example, than of students’ depression or anxiety; the latter problems are more covert in nature and can go undetected even when at seriously high levels (Flett, Hewitt, Nepon, & Zaki-Azat, 2018; Luthar et al., 2020).

Additionally, the WBI can help identify subgroups of youth who are particularly struggling in a given school. Students with symptoms falling in the troubling “red zone” can vary across institutions, for example, by grade level (with freshmen standing out in some cases or in others, juniors immersed in college applications), as well as across different demographic subgroups (e.g., with distress elevated among particular sexual or ethnic minorities or international students). In turn, identifying vulnerable subgroups can help target mental health resources to where they are most needed. This can be particularly helpful in low-income schools, where resources for mental health in are typically scant (Hoagwood et al., 2018), necessitating efficient, targeted programs rather than “universal” interventions for all students.

There could also be much value in administering the WBI routinely in relatively well-resourced schools, characterized by high levels of achievement; in fact, these students can report symptom levels commensurate with if not greater than those of their counterparts in poverty (Luthar et al., 2019; NASEM, 2019b). From the perspective of prospective parents, it could be valuable to have a gauge of whether schools truly are invested in fostering the development of the “whole child” (Luthar et al., 2019; Wilson & Marshall, 2019). In all likelihood, many parents would appreciate having information on the students’ overall mental health across critical domains of adolescent adjustment, in addition to stellar records on academics and extracurricular activities.

Besides measuring adolescents’ symptoms in critical mental health domains, another potentially useful application of the WBI lies the use of the scale capturing feelings of isolation at school.

Decades of research on resilience have shown that relationships are fundamental to doing well in despite stress (Luthar, Crossman, & Small, 2015; NASEM, 2019a). Additionally, negative relationship indices tend to be more powerful than positive ones in affecting one’s well-being (i.e., “bad is stronger than good”; Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001). Thus, feeling alienated by adults and peers at school, or simply dreading being at school, can make a substantial difference in affecting students overall, including their academic performance (Leschied et al., 2018). This said, to our knowledge, there exists no brief measure capturing these sentiments; the WBI subscale examined and validated here could help fill this gap.

Finally, there are three issues worth noting with regard to the use of the moniker “Well-Being Index” for this measure that in fact encompasses adjustment problems. First, in developmental research that is described as covering children’s “well-being” or “health,” outcomes in fact commonly include symptoms such as depression, anxiety, and substance use, as well as dimensions of social exclusion (Best, Manktelow, & Taylor, 2014; Patton et al., 2016; Sieving et al., 2001; Vanassche, Sodermans, Matthijs, & Swicegood, 2013). Second, in contemporary school-based surveys of students’ psychological or behavioral difficulties, instruments often reference health rather than illness, for example, the Global School-based Student Health Survey (Center for Disease & Prevention, 2020) and the Independent School Health Check (2020). Third, in the world of practice within K-12 education, enhancing overall “well-being” of students is typically viewed as implying low levels of symptoms. To illustrate, Wilson and Marshall (2019) exhort schools to appraise how they “conceptualize and adopt a definition of health and wellness . . . and how they use it to inform their approaches to very real problems—student suicide, depression, anxiety, self-harm, peer-to-peer sexual assault, self-medication/drug and alcohol abuse.”

Limitations and Future Directions

Among the limitations of this study, the first is that the present sample included only high school students (Grades 9 to postgrad), although the assessment tool is intended for use with youth from Grade 6 through Grade 12. In the future, the WBI should be tested with middle schoolers as well, aged 11–14 years. Second, data were only collected with students in two areas of the country, Northeast and Southwest; the measure should be validated in different parts of the country and with demographically heterogeneous samples. With regard to psychometric properties, future studies should also consider test-retest coefficients as indices of reliability, in addition to levels of internal consistency.

There are several limitations associated with the sole reliance on one informant in this study; scores on both the WBI and YSR were based in self-reports (as are many adolescent symptom scales described at the outset of this article). The monomethod, monoinformant approach could have led to underreporting on some scales more so than others, with lower acknowledgment of externalizing behaviors, for example, than internalizing symptoms. Additionally, it could have led to some inflations in associations among measures. With regard to the latter issue, it should be reiterated that in fact, of central interest in validating WBI subscales are links between students’ subjective experiences of their own distress and the quality of salient relationships in their lives, also as perceived

by the teens themselves. This said, future studies might usefully examine the degree to which assessments based on the WBI converge with or differ from those based on reports from other informants, such as parents or teachers (these adults' ratings were not available here as the schools administered surveys anonymously, allowing no identifiers for individuals' data).

Summary and Conclusions

In conclusion, data presented here suggest the validity of the WBI as a brief, scientifically sound measure to assess the adjustment of adolescents. Its use in school-based assessments can help fill a critical need: Early and expedient detection of mental health issues, so that interventions can be targeted to students who most need them, and in areas within which they are most vulnerable (Leschied et al., 2018). The central role of mental health promotion in schools, in fact, is now explicitly emphasized by researchers as well as practitioners. In their introduction to the *Handbook of School-Based Mental Health Promotion*, the editors emphasized,

(The) challenges and problems on the mental health front have become urgent enough that . . . a focus on mental health promotion in children and adolescents must become part of the regular school day, and this is just as important as the more traditional educational learning that takes place in our schools. (Leschied et al., 2018, p. 1; see also Offner, 2018)

Similarly, in their report on the foundations of student success, Wilson and Marshall (2019) noted that whereas schools' central focus is on academics, students' "current and long-term mental, emotional, and physical well-being strongly contribute to their ultimate success in life". Thus, there is a critical need to carefully measure critical mental health indices and track these over time (needless to say, such ongoing assessments could be still more useful in wake of pandemic-related disruptions across schools). It is our hope that given the documented psychometric properties and ease of administration given its brevity, the WBI can be applied in future school-based assessments toward maximizing the wellness of a generation of highly stressed youth.

References

- Achenbach, T. M., & Rescorla, L. A. (2001). *Manual for the ASEBA School-Age Forms & Profiles*. Burlington: University of Vermont, Research Center for Children, Youth, & Families.
- American Institutes for Research. (2011). *2011 School Climate and Connectedness Survey: Statewide report*. Retrieved from <https://eric.ed.gov/?q=drugs&ff1=eduGrade+3&id=ED577047>
- American Psychological Association. (2018). Stress in America: Generation Z. Retrieved from <https://www.apa.org/news/press/releases/stress/2018/stress-gen-z.pdf>
- Armsden, G. C., & Greenberg, M. T. (1987). The inventory of parent and peer attachment: Individual differences and their relationship to psychological well-being in adolescence. *Journal of Youth and Adolescence*, 16, 427–454. <http://dx.doi.org/10.1007/BF02202939>
- Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology*, 5, 323–370. <http://dx.doi.org/10.1037/1089-2680.5.4.323>
- Beck, J. S., Beck, A. T., Jolly, J. B., & Steer, R. A. (2005). *Beck Youth Inventories for Children and Adolescents manual* (2nd ed.). San Antonio, TX: PsychCorp.
- Best, P., Manktelow, R., & Taylor, B. (2014). Online communication, social media and adolescent wellbeing: A systematic narrative review. *Children and Youth Services Review*, 41, 27–36. <http://dx.doi.org/10.1016/j.childyouth.2014.03.001>
- Brener, N. D., Collins, J. L., Kann, L., Warren, C. W., & Williams, B. I. (1995). Reliability of the youth risk behavior survey questionnaire. *American Journal of Epidemiology*, 141, 575–580. <http://dx.doi.org/10.1093/oxfordjournals.aje.a117473>
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136–162). Newbury Park, CA: Sage.
- Center for Disease and Prevention. (2020). *Global School-Based Student Health Survey (GSHS)*. Retrieved from <https://www.cdc.gov/gshs/questionnaire/index.htm>
- Centers for Disease Control and Prevention. (1995). *Youth risk behavior survey data*. Retrieved from www.cdc.gov/yrbbs
- DeVellis, R. F. (2016). *Scale development: Theory and applications* (Vol. 26). Thousand Oaks, CA: Sage.
- Domitrovich, C. E., Durlak, J. A., Staley, K. C., & Weissberg, R. P. (2017). Social-emotional competence: An essential factor for promoting positive adjustment and reducing risk in school children. *Child Development*, 88, 408–416. <http://dx.doi.org/10.1111/cdev.12739>
- Ebbert, A. E., Kumar, N. L., & Luthar, S. S. (2019). Complexities in adjustment patterns among the "best and the brightest": Risk and resilience in the context of high-achieving schools. *Research in Human Development*, 16, 21–34. <http://dx.doi.org/10.1080/15427609.2018.1541376>
- Flett, G. L. (2018). Resilience to interpersonal stress: Why mattering matters when building the foundation of mentally healthy schools. In A. W. Leschied, D. H. Safloske, & G. L. Flett (Eds.), *Handbook of school-based mental health promotion* (pp. 383–410). Cham, Switzerland: Springer. http://dx.doi.org/10.1007/978-3-319-89842-1_20
- Flett, G. L., Hewitt, P. L., Nepon, T., & Zaki-Azat, J. N. (2018). Children and adolescents flying under the radar: Understanding, assessing, and addressing hidden distress among students. In A. W. Leschied, D. H. Safloske, & G. L. Flett (Eds.), *Handbook of school-based mental health promotion* (pp. 357–381). Cham, Switzerland: Springer International Publishing. http://dx.doi.org/10.1007/978-3-319-89842-1_19
- Hoagwood, K. E., Atkins, M., Kelleher, K., Peth-Pierce, R., Olin, S., Burns, B., . . . Horwitz, S. M. (2018). Trends in children's mental health services research funding by the National Institute of Mental Health from 2005 to 2015: A 42% reduction. *Journal of the American Academy of Child & Adolescent Psychiatry*, 57, 10–13. <http://dx.doi.org/10.1016/j.jaac.2017.09.433>
- Hovens, J. G., Cantwell, D. P., & Kiriakos, R. (1994). Psychiatric comorbidity in hospitalized adolescent substance abusers. *Journal of the American Academy of Child & Adolescent Psychiatry*, 33, 476–483. <http://dx.doi.org/10.1097/00004583-199405000-00005>
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analyses: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1–55. <http://dx.doi.org/10.1080/10705519909540118>
- Huizinga, D., & Elliot, D. S. (1986). Reassessing the reliability and validity of self-report delinquency measures. *Journal of Quantitative Criminology*, 2, 293–327.
- Independent School Health Check. (2020). *The Independent School Health Check Administration Manual, 2019–2020*. Retrieved from <https://independentschoolhealth.com/services/>
- Johnston, L. D., O'Malley, P. M., Bachman, J. G., Schulenberg, J. E., & Miech, R. A. (2014). *Monitoring the Future national survey results on drug use, 1975–2013: Vol. II. College students and adults ages 19–55*. Ann Arbor: University of Michigan, Institute for Social Research.
- Kumar, N. L. (2019). *The Well-Being Index: A measure of youth mental health*. Unpublished document. Cambridge, MA: Authentic Connections.

- Lee, I. A., & Preacher, K. J. (2013, September). Calculation for the test of the difference between two dependent correlations with one variable in common [Computer software]. Retrieved from <http://quantpsy.org>
- Leschied, A. W., Saklofske, D. H., & Flett, G. L. (2018). *Handbook of school-based mental health promotion: An evidence-informed framework for implementation*. Cham, Switzerland: Springer. <http://dx.doi.org/10.1007/978-3-319-89842-1>
- Luthar, S. S., Crossman, E. J., & Small, P. J. (2015). Resilience and adversity. In R. M. Lerner & M. E. Lamb (Eds.), *Handbook of child psychology and developmental science* (7th ed., Vol. III, pp. 247–286). New York, NY: Wiley. <http://dx.doi.org/10.1002/9781118963418.childpsy307>
- Luthar, S. S., & Eisenberg, N. (2017). Resilient adaptation among at-risk children: Harnessing science toward maximizing salutary environments. *Child Development*, 88, 337–349. <http://dx.doi.org/10.1111/cdev.12737>
- Luthar, S. S., & Kumar, N. L. (2018). Youth in high-achieving schools: Challenges to mental health and directions for evidence-based interventions. In A. W. Leschied, D. H. Saklofske, & G. L. Flett (Eds.), *Handbook of school-based mental health promotion: An evidence-informed framework* (pp. 441–458). New York, NY: Springer. http://dx.doi.org/10.1007/978-3-319-89842-1_23
- Luthar, S. S., Kumar, N. L., & Zillmer, N. (2019). High-achieving schools connote risks for adolescents: Problems documented, processes implicated, and directions for interventions. *American Psychologist*. Advance online publication. <http://dx.doi.org/10.1037/amp0000556>
- Luthar, S. S., Kumar, N. L., & Zillmer, N. (2020). Teachers' responsibilities for students' mental health: Challenges in high achieving schools. *International Journal of School & Educational Psychology*, 8, 119–130. <http://dx.doi.org/10.1080/21683603.2019.1694112>
- Millings, A., Buck, R., Montgomery, A., Spears, M., & Stallard, P. (2012). School connectedness, peer attachment, and self-esteem as predictors of adolescent depression. *Journal of Adolescence*, 35, 1061–1067. <http://dx.doi.org/10.1016/j.adolescence.2012.02.015>
- Moffitt, T. E. (2003). Life-course-persistent and adolescence-limited antisocial behavior: A 10-year research review and a research agenda. In B. B. Lahey, T. E. Moffitt, & A. Caspi (Eds.), *Causes of conduct disorder and juvenile delinquency* (pp. 49–75). New York, NY: Guilford Press.
- Muthén, L. K., & Muthén, B. O. (2013). *Mplus: Statistical analyses with latent variables: User's guide*. (Version 7.11). Los Angeles, CA: Author.
- National Academies of Science, Engineering, and Medicine (NASEM). (2019a). *The promise of adolescence: Realizing opportunity for all youth*. Washington, DC: The National Academies Press.
- National Academies of Science, Engineering, and Medicine (NASEM). (2019b). *Vibrant and healthy kids: Aligning science, practice, and policy to advance health equity*. Washington, DC: The National Academies Press. <http://dx.doi.org/10.17226/25466>
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York, NY: McGraw-Hill.
- Offner, D. (2018). *Mental health in the classroom: Educators as the "first responders"*. Retrieved from www.nais.org/learn/independent-ideas/april-2018/mental-health-in-the-classroom-educators-as-the-first-responders
- Patton, G. C., Sawyer, S. M., Santelli, J. S., Ross, D. A., Afifi, R., Allen, N. B., . . . Viner, R. M. (2016). Our future: A Lancet commission on adolescent health and wellbeing. *Lancet*, 387, 2423–2478. [http://dx.doi.org/10.1016/S0140-6736\(16\)00579-1](http://dx.doi.org/10.1016/S0140-6736(16)00579-1)
- Prinstein, M. J., Boergers, J., & Vernberg, E. M. (2001). Overt and relational aggression in adolescents: Social-psychological adjustment of aggressors and victims. *Journal of Clinical Child Psychology*, 30, 479–491. http://dx.doi.org/10.1207/S15374424JCCP3004_05
- Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385–401. <http://dx.doi.org/10.1177/014662167700100306>
- Reynolds, C. R., & Kamphaus, R. W. (1992). *Behaviour Assessment System for Children Manual*. Circle Pines, MN: American Guidance Service.
- Roberts, R. E., Roberts, C. R., & Chan, W. (2009). One-year incidence of psychiatric disorders and associated risk factors among adolescents in the community. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 50, 405–415. <http://dx.doi.org/10.1111/j.1469-7610.2008.01969.x>
- Roberts, R. E., Roberts, C. R., & Xing, Y. (2007). Rates of DSM-IV psychiatric disorders among adolescents in a large metropolitan area. *Journal of Psychiatric Research*, 41, 959–967. <http://dx.doi.org/10.1016/j.jpsychires.2006.09.006>
- Sieving, R. E., Beurhing, T., Resnick, M. D., Bearinger, L. H., Shew, M., Ireland, M., & Blum, R. W. (2001). Development of adolescent self-report measures from the national longitudinal study of adolescent health. *Journal of Adolescent Health*, 28, 73–81. [http://dx.doi.org/10.1016/S1054-139X\(00\)00155-5](http://dx.doi.org/10.1016/S1054-139X(00)00155-5)
- Steiger, J. H. (1980). Tests for comparing elements of a correlation matrix. *Psychological Bulletin*, 87, 245–251. <http://dx.doi.org/10.1037/0033-2909.87.2.245>
- Steiger, J. H. (1990). Structural model evaluation and modification: An interval estimation approach. *Multivariate Behavioral Research*, 25, 173–180. http://dx.doi.org/10.1207/s15327906mbr2502_4
- Twenge, J. M., Cooper, A. B., Joiner, T. E., Duffy, M. E., & Binau, S. G. (2019). Age, period, and cohort trends in mood disorder indicators and suicide-related outcomes in a nationally representative dataset, 2005–2017. *Journal of Abnormal Psychology*, 128, 185–199. <http://dx.doi.org/10.1037/abn0000410>
- Vanassche, S., Sodermans, A. K., Matthijs, K., & Swicegood, G. (2013). Commuting between two parental households: The association between joint physical custody and adolescent wellbeing following divorce. *Journal of Family Studies*, 19, 139–158. <http://dx.doi.org/10.5172/jfs.2013.19.2.139>
- Vaz, S., Falkmer, M., Parsons, R., Passmore, A. E., Parkin, T., & Falkmer, T. (2014). School belongingness and mental health functioning across the primary-secondary transition in a mainstream sample: Multi-group cross-lagged analyses. *PLoS ONE*, 9(6), e99576. <http://dx.doi.org/10.1371/journal.pone.0099576>
- Wallace, J. M., Jr., & Bachman, J. G. (1991). Explaining racial/ethnic differences in adolescent drug use: The impact of background and lifestyle. *Social Problems*, 38, 333–357. <http://dx.doi.org/10.2307/800603>
- Wheeler, A. P. (2017, June 12). *Testing the equality of coefficients same independent different dependent variables*. Retrieved from <https://andrewpwheeler.com/2017/06/12/testing-the-equality-of-coefficients-same-independent-different-dependent-variables/>
- Wilson, D. P., & Marshall, M. G. (2019). *Reframing the foundation for student success*. Retrieved from <https://www.nais.org/magazine/independent-school/summer-2019/educating-the-whole-student/>

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