An Application of the Dual-Factor Model of Mental Health in Elementary School Children: Examining Academic Engagement and Social Outcomes

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Abstract

Conceptualizations of mental health have increasingly emphasized the presence of subjective well-being (SWB), rather than assessing internalizing and externalizing behaviors (IEB) and disorders in isolation. This cross-sectional study examined the mental health of 178 American elementary school students through this dual-factor lens. Approximately 54% of child participants (Grades 4 and 5) met sample-specific criteria for Complete Mental Health (high SWB and low IEB), 18.5% met criteria for Symptomatic But Content (high SWB, elevated IEB), 18.5% met criteria for Vulnerable (low SWB, low IEB), and 9% met criteria for Troubled (low SWB, elevated IEB). Students in the Symptomatic but Content group had fewer internalizing behaviors than the Troubled group. Associations between mental health group status and social and academic outcomes varied by teacher and student ratings. On student-reported outcomes, mental health groups with high SWB had greater perceptions of social support and academic engagement in the classroom, consistent with findings from other studies documenting advantages of SWB above and beyond low IEB (Complete Mental Health vs. Vulnerable) or when elevated IEB is present (Symptomatic but Content vs. Troubled). In contrast, teacher perceptions of students' engagement in the classroom and social relationships were more closely negatively associated with IEB. When SWB was examined as a continuous variable, regression analyses indicated a positive, additive effect of SWB on all indicators of engagement- including teacher report measures.

Keywords: Subjective well-being, dual-factor model of mental health, internalizing behaviors, externalizing behaviors, classroom relationships, student engagement

Introduction

Since the turn of the 21st century, treatment viewpoints of mental health have transitioned from an illness-oriented practice towards the promotion of wellness (Seligman, 2011). Research has indicated that individuals with greater subjective well-being (SWB; individual's perceived quality of life, including both cognitive and affective components) have better physical health and longevity, and possess superior outcomes across multiple domains (e.g., academic achievement, social relationships; Bucker et al., 2018; Diener & Chan, 2011; Suldo & Shaffer, 2008). Considering the importance of SWB, and the high prevalence of mental illness in youth (Merikangas et al., 2009), understanding the interplay between SWB and psychopathology (often examined as internalizing and externalizing behaviors [IEB] and disorders) has never been more warranted. Viewing children holistically is vital based on the separability of SWB and psychopathology, and positive associations between SWB and interpersonal relationships (Greenspoon & Saklofske, 2001). Less is known about the mental health of American children when using a dual-factor approach that considers psychological well-being and problems; extant studies in the U.S. have been limited to adolescents (i.e., students in middle and high school). The purpose of this study was to extend the literature on SWB and IEB through the application of the dual-factor model of mental health to an elementary school sample (4th and 5th grade students), and better understand the implications of SWB on outcomes that are particularly salient to elementary

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school—classroom relationships and academic engagement in class.

Dual-Factor Model of Mental Health

Mental health conceptualization has transitioned from a medical model (e.g., presence or absence of internalizing and externalizing forms of mental disorders) to more holistic models that include assessments of both IEB and well-being. Keyes (2005) has defined complete mental health as the presence of high emotional, psychological, and social well-being, which is related to but separable from the presence of mental disorders. More recently, Keyes illustrated that mental distress and well-being are distinct components of overall mental health in youth and found that a substantial proportion of adolescents and young adults with flourishing well-being also manifested anxiety, depressive, or substance use disorders (Hides et al., 2019). One framework utilized to examine positive and negative dimensions of mental health in tandem has been coined a Dual-Factor Model of Mental Health (DFM; Greenspoon & Saklofske, 2001; Suldo & Shaffer, 2008). The positive psychological indicator that has been utilized most often in prior research on the DFM is SWB. There is some disagreement among scholars about how to best operationalize well-being, and which combination of positive psychological indicators should be examined. Case in point, personal happiness and emotional flourishing has been defined by "feeling good" about life (hedonic tradition) and striving for excellence and functioning well in life (eudaimonic tradition; Keyes, 2009). The subjective well-being framework for studying happiness is most closely tied to the hedonic tradition. Factor analytic studies have failed to support meaningful differentiation between increasingly complex conceptualizations of well-being; at the latent level, SWB correlates near perfectly (r > .95) with eudaimonia (Disabato et al., 2016). In this study, we utilized SWB to represent the positive psychological factor with the aims of parsimony and alignment with prior studies of the DFM.

SWB affords examination of one's life satisfaction and affect ratio (frequency of positive to negative emotional experiences; Diener, 2000). Different from indicators of psychopathology, SWB purposefully gauges the full range of emotional experience from dissatisfied/languishing to extremely satisfied/ flourishing. The DFM yields four mental health groups, defined according to low or high levels of psychopathology (IEB) and SWB, termed Complete Mental Health (high SWB, low IEB), Vulnerable (low SWB, low IEB), Symptomatic But Content (high SWB, high IEB), and Troubled (low SWB, high IEB).

The presence of these four groups has been supported through research with samples of youth and young adults in Canadian elementary schools (Greenspoon & Saklofske, 2001), U.S. middle schools (Antaramian et al., 2010; Suldo & Shaffer, 2008), U.S. high schools (Rose et al., 2017; Suldo, et al., 2016), Chinese secondary schools (Xiong et al., 2017), and U.S. colleges (Antaramian, 2015; Eklund et al., 2011; Renshaw & Cohen, 2014), as well as in non-school settings such as adolescents in residential care in Portugal (Magalhaes & Calheiros, 2017) and adults receiving inpatient psychiatric care (Teismann et al., 2018). A primary contribution of the DFM is that it makes possible the identification of two groups that either may not be identified (Vulnerable) or fully understood (Symptomatic But Content) if solely using a traditional medical model approach that emphasizes outward IEB symptoms. A visual depiction of this model is provided in Table 1 and each mental health group is further summarized below.

Complete Mental Health. Prior applications of the DFM to school-based samples of youth operationalized psychopathology as frequency of IEB—with "high" often reflecting T-scores > 60 on rating scales (based on norms) created to assess psychopathology—rather than disorders diagnosed through clinical interviews. In such research, the majority of youth (about 60% of participants) were classified as having Complete Mental Health which reflects few internalizing or externalizing behaviors and average to high levels of SWB (Suldo, 2016). There are a host of positive outcomes associated with this profile sometimes referred to as "well-adjusted" or "positive mental health." Students with Complete Mental Health status generally possess better attitudes toward school (Antaramian, 2015; Suldo et al., 2016), have superior grades (Antaramian, 2015; Eklund et al., 2011; Renshaw & Cohen, 2014; Suldo & Shaffer, 2008; Suldo et al., 2016), perceive better physical health (Suldo et al., 2016), and experience higher quality social relationships (Antaramian et al., 2010; Greenspoon & Saklofske, 2001; Suldo & Shaffer, 2008; Suldo et al., 2016). The Complete Mental Health group typically has superior developmental outcomes in relation to students within groups characterized by high levels of IEB, whereas the Vulnerable group does not, therefore supporting the positive outcomes associated with the combination of high well-being and low emotional or behavioral problems.

Table 1. Groups yielded from dual-factor model of mental health

Levels of Internalizing and Externalizing Behaviors (IEB)	Level of Subjective Well-Being (SWB)	
	Low	Average to High
Low	**Vulnerable** SWB composite <27.5th percentile; externalizing score T<7 (boys) or <3 (girls) and internalizing score < 4 (boys) or <3 (girls)	**Complete Mental Health** SWB composite ≥27.5th percentile; externalizing score T<7 (boys) or <3 (girls) and internalizing score < 4 (boys) or <3 (girls)
Elevated	**Troubled** SWB composite <27.5th percentile; externalizing score T≥7 (boys) or ≥3 (girls) and internalizing score ≥4 (boys) or ≥3 (girls)	**Symptomatic But Content** SWB composite ≥27.5th percentile; externalizing score T≥7 (boys) or ≥3 (girls) and internalizing score ≥4 (boys) or ≥3 (girls)

Note. In this study's sample ($N = 178$), low SWB (i.e., <27.5th percentile) corresponded to a z-score of -1.00 on the SWB composite variable, SLSS score < 4.3, PANAS-C PA score ≤ 3.8, and PANAS-C negative affect score ≥ 2.2.

Vulnerable. This group encompasses those students who do not have elevated IEB (per elevated scores on rating scales) but nevertheless report diminished SWB. This group has been referred to as Vulnerable because they evidence worse outcomes relative to their peers with high SWB, but would not be identified in current school-based practice that emphasizes screening for emotional and behavioral problems in line with the bulk of available interventions intended to reduce problems rather than increase well-being (Humphrey & Wigelsworth, 2016). A Vulnerable mental health status comprises on average about 13% of youth samples (Suldo, 2016). In prior studies, students with a Vulnerable mental health status have had diminished self-concept (Greenspoon & Saklofske, 2001; Suldo & Shaffer, 2008; Suldo et al., 2016), worse physical health (Suldo et al., 2016), lower grades (Antaramian, 2015; Eklund et al., 2011; Renshaw & Cohen, 2014; Suldo & Shaffer, 2008), and less social support (classmate and teacher; Suldo et al., 2016), when compared to their peers with Complete Mental Health (i.e., higher SWB). Students classified in this group are theoretically unlikely to receive targeted mental health supports using a traditional model that emphasizes identification and treatment of IEB, but there is a growing evidence base for increasing well-being through school-based positive psychology interventions for students with low SWB (e.g., Roth et al., 2017).

Symptomatic but Content. This group includes individuals who at a given point in time report high levels of SWB despite concurrent elevated IEB. Group size is sensitive to cut points used to define "high psychopathology," with smaller numbers logically following a focus on disorders rather than elevated IEB. Prior studies focused largely on the latter have identified an average of 12% of samples of youth as Symptomatic But Content (Suldo, 2016). In comparison to their Troubled peers, a Symptomatic But Content mental health status is more readily associated with positive social outcomes like higher perceived social support and teacher-rated sociability, and less peer victimization (Antaramian et al., 2010; Greenspoon & Saklofske, 2001; Suldo & Shaffer, 2008; Suldo et al., 2016). The IEB that youth in this group experience may be less damaging due to the protective nature of SWB (Suldo & Huebner, 2004). However, among adolescent samples, academic achievement has been similarly diminished among Symptomatic But Content and Troubled students (Suldo & Shaffer, 2008; Suldo et al., 2016).

Troubled. In applications of the DFM model to middle and high school students, about 15% of youth have been identified as Troubled, demonstrating elevated IEB along with low SWB (Suldo, 2016). The Troubled group has routinely experienced the worst current and later outcomes on indicators of academic achievement (Antaramian, 2015; Renshaw & Cohen, 2014; Suldo & Shaffer, 2008; Suldo et al., 2016), perceived social support (Antaramian et al., 2010; Greenspoon & Saklofske, 2001; Renshaw & Cohen, 2014; Suldo & Shaffer, 2008; Suldo et al., 2016), and physical health (Suldo et al., 2016). Students with a Troubled mental health status is likely to be those in greatest need of intense school-based supports.

Current State of the Research on the Dual-Factor Model of Mental Health

A growing body of research supports the presence and utility of a DFM of mental health in samples of adolescents and young adults. However, only one study—Greenspoon and Saklofske's (2001) pioneering examination of 407 students in 3rd through 6th grade in

Western Canada—has applied a DFM to understanding mental health in elementary school children. Findings from that study are limited in applicability, given the homogenous sample and the method used to create groups (i.e., eliminating cases with borderline SWB or IEB scores, rather than assigning a group to each participant). The current study is the first known application of the DFM in U.S. elementary school students (drawn from a geographic area with considerable ethnic diversity), using classification methods that are consistent with procedures followed in analogous studies of U.S. samples (e.g., Suldo & Shaffer, 2008; Suldo et al., 2016).

Doll (2008) criticized studies of the DFM that failed to address the fundamental differences between the two constructs that contribute to psychopathology—externalizing and internalizing symptoms—through collapsing youth with either internalizing or externalizing features into a single "high psychopathology" group without consideration of the student's type of mental health problem(s). In an exception, Greenspoon and Saklofske (2001) examined types of psychopathology separately and found that Vulnerable students were distinguished from Troubled students by a lack of internalizing behaviors, whereas the Symptomatic But Content group was characterized by high levels of externalizing behaviors, in particular hyperactivity.

The utility of the DFM is perhaps best established through identification of differences between the four mental health groups in outcomes of relevance to a developmental domain such as academic or social success. Differences in adjustment between students with similar levels of IEB but different levels of SWB illustrate the need to examine both SWB and IEB in assessment of youth mental health, in part to identify students in greatest and least need of supports. For example, prior studies of the DFM have examined key differences in perceived social support across the four groups. Greenspoon and Saklofske (2001) illustrated that children with higher SWB had greater interpersonal relationships with parents, teachers, and peers when compared to their peers with low SWB. In American samples, middle school students in groups defined by high SWB (regardless of level of IEB) reported greater support from classmates and teachers (Suldo & Shaffer, 2008) just as high SWB was linked to greater romantic relationship satisfaction and decreased peer victimization among high school students (Suldo et al., 2016). In the current study we further examined relationships with teachers and peers, to determine if these findings replicate among U.S. children and with multiple raters of relationship quality. We also explored student engagement, to address the paucity of academic outcomes examined in relation to elementary school students' mental health status as indicated using a DFM.

Social relationships. Children's social competence and classroom relationships are integrally tied to their academic success (Baker, 2006; Elias & Haynes, 2008) and positive mental health (i.e., SWB; Liu et al., 2016). The quality of the relationship between a student and his or her teacher is one of the most notable predictors of academic performance and behavioral success in school (Hamre & Pianta, 2001; Hernández et al., 2017), and teacher-student relationships at the next grade level (Hughes & Cavall, 1999). However, the disruptive behaviors that characterize students with externalizing behaviors generally reduce the quality of the relationship with classroom teachers, due to the frequency of the negative interactions that occur (Baker et al., 2008); less is known about associations between internalizing behaviors and teacher-student relationships (Murray & Murray, 2004). The current study examined multiple aspects of social relationships to better understand the implications of mental health status as yielded in a DFM, on students' relationships with classmates and teachers. Convergence between teacher-rated relationship quality and student reports of teacher support and conflict are modest (e.g., Suldo et al., 2014). Thus, we examined indicators of classroom relationships from multiple sources—teachers and students.

Academic engagement. Student engagement with schooling is conceptualized as involving multiple interrelated dimensions, including behavioral (e.g., participating in school events, on task classroom behavior) and affective/emotional (e.g., experiencing positive emotions related to school, feeling connected in the classroom) forms of engagement (Reschly et al., 2017). Engagement at school is critical to later academic success, as it is tied to promotive academic attitudes (e.g., motivation towards school; Wang & Eccles, 2013), skills as reflected in higher grades (Wang & Holcombe, 2010) and standardized test scores (Caraway et al., 2003), and ultimately greater likelihood of school completion (Ladd & Dinella, 2009) and reduced likelihood of drop out (Henry et al., 2012). Mental health benefits linked to student engagement include decreased rates of depression (Li & Lerner, 2011) and greater SWB (Backman, 2016; Lewis et al., 2011). In the elementary school years, student engagement can be measured though direct observation of classroom behavior or through ratings of typical classroom behavior as

perceived by teachers and students (Fredricks et al., 2011). Student report surveys provide a unique insight into personal perceptions of one's mindsets and intentions, but also require youth to report on behaviors which might be difficult to accurately estimate outside of context (Appleton et al., 2008). Teacher report measures may provide a more objective view of actual behavior, but may also be susceptible to various teacher biases (e.g., student achievement level, prior experience completing rating scales) and error associated with inference especially when asking teachers to interpret students' emotions based on their classroom behaviors and academic performance (Wang et al., 2016). In the present study, we examined student mental health in relation to multiple dimensions of engagement (affective, behavioral) in the classroom from multiple perspectives (teachers, students). Emotional participation is reflected in students' enthusiasm and interest in learning, while behavioral participation is reflected in time on-task and persistence with difficult assignments (Skinner, Kindermann, & Furrer, 2009).

Study Purpose

The purpose of this study was to examine the mental health of elementary school students through a first application of the DFM in children in the U.S. After identification of a sizable representation of children in each quadrant, we tested for between group differences in (a) forms of IEB (i.e., mean values of externalizing vs. internalizing behaviors) and (b) student and teacher perceptions of youth outcomes in areas particularly salient to childhood—classroom social relationships and academic engagement. This study sought to extend findings from prior research that provided support for the utility of the DFM by identifying differences in outcomes including between groups of youth with similar levels of IEB but opposing levels of SWB. A concern with conclusions drawn from research on the DFM is that scores on continuous measures are used to categorize students into one of four groups. Treating mental health variables as categorical has a long history in school and clinical psychology because it interfaces well with clinical practice and systems of support, but the process of categorizing students based on continuous variables results in a loss of information about individual differences (MacCallum, Zhang, Preacher, & Rucker, 2002). Thus, the potential additive value of SWB in explaining co-occurring student adjustment was further examined in regression analyses where both IEB and SWB were treated as continuous variables. Collectively, these categorical and continuous analyses were conducted to evaluate the potential value of

simultaneously considering problems and wellness when considering children's overall mental health.

Method

Participants

The sample included 178 students from one elementary school in a large public-school district in a southeastern state. The student body at the school was diverse in terms of race and ethnicity (55.0% Caucasian/White, 22.5% Hispanic, 8.9% African American/Black, 3.2% Asian, 9.7% multiracial), and socio-economic circumstances (SES; 51.4% of students were eligible for free or reduced-price lunch). This study reports secondary analysis of a dataset that was part of a larger study that evaluated a classwide positive psychology intervention implemented during the fall of 2015 (Hearon, 2017). Students with consent to participate in data collection/evaluation efforts were from seven 4th grade classes ($N = 79$; 44.4%) and seven 5th grade classrooms ($N = 99$; 55.6%). The sample included 94 females (52.8%). School records identified participants as White (60.5%), Hispanic (22.1%), Black (4.7%), Asian (2.9%), or multiracial (9.9%); 43.6% were eligible for free or reduced-price lunch. The mean age of participants was 9.8 years old (range = 8 to 12).

Measures
Subjective Well-Being
Students' Life Satisfaction Scale (SLSS; Huebner, 1991). The SLSS is a seven-item self-report measure of global life satisfaction, the cognitive dimension of SWB. Using a 6-point response metric from (1) *strongly disagree* to (6) *strongly agree*, participants rated statements in relation to their life at the current time (e.g., "My life is going well"). The SLSS has yielded strong psychometric properties in earlier studies with elementary school students (Proctor et al.,2009), including acceptable internal consistency (α = .79) in a sample of 148 4th and 5th grade students (Hoy et al., 2013). In the current study, α = .76.

Ten-item Positive and Negative Affect Schedule for Children (PANAS-C-10; Ebesutani et al., 2012). The 10-item PANAS-C is an abbreviated version of the 27-item PANAS-C (Laurent et al., 1999) examines the frequency with which children experience various positive and negative emotions. Participants indicate how often they have experienced positive feelings (e.g., proud, joyful, cheerful) and negative feelings (e.g., sad, scared, mad) in the past few weeks on a scale of (1) *very slightly or not at all* to (5) *extremely*. Responses to the five positive and five negative feeling words are averaged to yield mean scores of positive affect (PA) and negative affect (NA). Ebesutani and colleagues (2012)

reported adequate internal consistency for the PA (α = .86) and NA (α = .82) scales in a sample of 799 children ages 6-18 years old. In the current study, α = .81 and .77 for PA and NA, respectively.

Internalizing and Externalizing Behaviors

Student Internalizing Behavior Screener (SIBS; Cook et al., 2011). The SIBS is a seven-item teacher report measure of student internalizing behavior (e.g., "seems sad or unhappy"; "withdrawn"). This measure utilizes a scale from (0) *never* to (3) *frequently/almost always.* In measure development work with 1,357 elementary school students (Grades 1 – 5), Cook and colleagues (2011) reported satisfactory internal consistency (α = .78) and test-retest reliability across a two-month interval (r = .74). Hartman et al. (2017) also found support for satisfactory reliability (α = .71 - .88; r = .79 over a one-month interval) in a sample of 154 students in Grades 1 – 5. In terms of validity, Cook et al. (2011) reported a strong correlation (r = .82) between the scores from the SIBS and the Achenbach System of Empirically Based Assessment (ASEBA) Teacher Report Form Internalizing scale. In the current study, α = .65.

Student Externalizing Behavior Screener (SEBS; Cook et al., 2012). The SEBS is a seven-item teacher report measure of observed student externalizing behaviors. Using the same response metric as in the SIBS, teachers report how often students display externalizing problems such as "has difficulty sitting still" and "fights or argues with peers." Cook et al. (2012) reported support for reliability (α = .89) and validity (r = .87 and .91) with the ASEBA Teacher Report Form Externalizing scale and the Student Risk Screening Scale (SRSS), respectively, from a study with 947 elementary and 4,194 middle and high school students. Hartman and colleagues (2017) found strong support for reliability (α = .92 to .93; r = .85) with elementary school children. In the current study, α = .79.

Social Relationships

Child and Adolescent Social Support Scale (CASSS; Malecki et al.,2000). The CASSS is a 60-item self-report measure of students' perceived support from five primary sources with whom they frequently interact: parents, close friends, classmates, school, and teachers (12 items per source). On a response metric of (1) *never* to (6) *always*, participants identify the degree to which "my classmates treat me nicely" or "my teacher(s) cares about me." In a sample of 353 students in Grades 3 – 6, Malecki and Demaray (2002) reported adequate internal consistency for both the teacher (α = .88) and classmate (α = .93) subscales, which are of primary interest in this study of classroom relationships. In the current study, α

= .89 and .93 for the teacher and classmate scales, respectively.

Teacher-Student Relationship Inventory (TSRI; Ang, 2005). The TSRI is a 14-item teacher rating scale that examines a teacher's perceived relationship with each of the students in his/her class, in three areas: instrumental help, relationship satisfaction, and conflict. The conflict items were not administered in this study. Teachers rate their agreement with statements such as "If the student has a problem at home he/she is likely to ask for help" (instrumental help) and "I enjoy having this student in my class" (relationship satisfaction), on a scale of (1) *almost never true* to (5) *almost always true*. Ang (2005) reported high reliability for Instrumental Help (α = .94) and Satisfaction (α = .84) in a study of 428 elementary school students rated by 19 teachers. In the current study, α = .93 and .91 for Instrumental Help and Satisfaction scales, respectively.

Academic Engagement

Engagement versus Disaffection with Learning-Student Report (EvsD-S; Skinner, et al., 2009). The 20-item EvsD assesses students' perceived classroom behavioral and emotional engagement and disaffection, through four 5-item scales related to students' behavioral engagement, behavioral disaffection, emotional engagement, and emotional disaffection. Students rate from (1) *not at all true* to (4) *very true* the extent to which they agree with statements assessing engagement (e.g., "I pay attention in class" [behavioral] and "Class is fun" [emotional]) and disaffection (e.g., "In class, I do just enough to get by" [behavioral] and "When I'm doing work in class, I feel bored" [emotional]). The two behavioral scales and the two engagement scales (with disaffection reverse-scored) were combined to form a 10-item behavioral engagement composite and a 10-item emotional engagement composite. In scale validation work with 1,018 students Grades 3-6, these behavioral and emotional engagement composites yielded high internal consistency (α= .79 and .86, respectively), and high stability (test-retest r = .70) across a single academic year (Skinner et al., 2009). In the current study, α = .78 and .81 for student-rated behavioral and emotional engagement, respectively.

Engagement versus Disaffection with Learning-Teacher Report (EvsD-T; Skinner et al., 2009). The 16-item teacher report of the EvsD assesses the same constructs as the EvsD-S but as observed and reported by teachers. The four 4-item scales related to students' behavioral engagement (e.g., students' attention, effort put forth in learning activities), behavioral disaffection (e.g., withdrawal from learning activities), emotional

engagement (e.g., motivation for learning), and emotional disaffection (e.g., withdrawal of motivation for learning). Teachers rate from (1) *not at all true* to (4) *very true* the extent to which items represent a given student's engagement (e.g., "In my class, this student works as hard as he/she can") and disaffection (e.g., "When we start something new in class, this student doesn't pay attention"). Skinner and colleagues (2009) scale validation work with 53 teachers of 1,018 students indicated high internal consistency and cross-year stability for behavioral engagement versus disaffection ($\alpha = .93$; test-retest $r = .85$) and emotional engagement versus disaffection ($\alpha = .81$; $r = .73$) composite scores. Regarding construct validity, teacher ratings of student engagement correlated with a subset of children's ($N = 56$ students) observed behavior ($r = .35$ to .40). EvsD-T composite scores were more strongly correlated with student ratings (EvsD-S) of the same type of engagement for behavioral engagement ($r = .42$ to. 44) than emotional engagement ($r = .26$ to. 33). In the current study, $\alpha = .95$ and .92 for teacher-rated behavioral and emotional engagement, respectively.

Procedures

Permission to conduct the study was received by the authors' university institutional review board and from the cooperating school district. At the start of the school year, letters describing the study and requesting written parent consent to participate were distributed to all students in 4th and 5th grade classrooms. This age group was targeted due to the reading skills needed for valid completion of self-report measures. Parent consent was obtained from 69% of the recruited sample. All students with parent consent provided written assent. Data analyzed in this study were collected in December 2015, a time point by which students had been in classes long enough to establish classroom relationships and, if relevant, manifest observable IEB.

Research team members administered the self-report measures to study participants within their class, working with groups of about 15 children at a time. Students were directed not speak with classmates while completing their surveys to ensure privacy. Students then completed the packet of measures, which were counterbalanced to control for order effects. Survey completion took between 30 to 45 minutes. To reduce incomplete or missing data, research team members visually scanned each completed packet. Students were privately prompted to review skipped items or response errors. Data were collected from teachers and students during the same week. Research team members provided teachers with envelopes that contained a TSRI, SIBS, SEBS, and EvsD-T for each student participant in their class and requested independent completion of surveys. Teachers were presented the SIBS and SEBS together, a procedure reported in prior use of these measures (e.g., Hartman et al., 2017). School records provided students' socioeconomic status (SES; eligibility for free or reduced-price lunch).

Overview of Analyses

All analyses were conducted using Statistical Analysis Software 9.4 (SAS). Mental health groups were formed using the measures of IEB (SIBS and SEBS) and SWB (SLSS, PANAS-C-10 PA and NA scales). Aligned with decisions made when designing the study (e.g., selection of self-report SWB indicators and teacher report IEB indicators), strategies used to form mental health groups followed prior research methods (see Antaramian et al., 2010; Suldo & Shaffer, 2008; Suldo et al., 2016). Some studies have advanced sample-specific SIBS and SEBS cut scores indicating clinically elevated or low levels of IEB (e.g., Hartman et al., 2017). In the absence of national norms for the SIBS and SEBS, we reviewed the frequency distributions for our sample in line with how Antaramian et al. (2010) created sample-specific cut scores for a different measure of IEB that also lacked national norms. Antaramian and colleagues utilized a *T* score ≥ 60 for high IEB and a *T* score ≤ 40 for low SWB, in line with guidelines for interpreting clinically elevated levels for psychopathology and adaptive behaviors, respectively (Reynolds & Kamphaus, 2004). We selected cut scores for the SIBS and SEBS that classified an expected percentage of youth as elevated (about 16% of our sample, corresponding to a *T* score ≥ 60) in terms of IEB, and accounted for gender differences in these behaviors. Students were then classified into mental health groups based on sample-specific norms for IEB and SWB following the procedures used in prior studies and further discussed in the presentation of our results.

In making comparisons between the mental health groups, we needed to account for the nesting of the students in classrooms, the fact that teachers provided ratings of student behaviors, and potential differences between classrooms that had been assigned to treatment and those assigned to business as usual. Given that these effects (i.e., classroom, teacher, treatment condition) could result in variability between classroom means, we controlled for each of them by including classroom effects in the statistical models. Since the number of classrooms was small, we treated classroom effects as fixed effects, as opposed to random effects, in our statistical models. For each outcome variable, a general linear model using unique (or Type III) sums-of-squares

was used to compare the mental health groups while controlling for classroom. Following significant group effects, Tukey-Kramer tests were used to compare group means, and to further investigate differences between each of the four mental health groups.

In addition to between group analyses that dichotomize continuous mental health variables as is often done in clinical practice in determination of "at risk" and "not at risk" for a psychological problem, we also examined the effects of SWB and IEB in their continuous form through regression models. The continuous measure of IEB was made as the sum of SIBS and SEBS (Hartman et al., 2017). The continuous SWB variable was made by computing the z-score for SLSS, PANAS-C-10 PA, and PANAS-C-10 NA and then subtracting the negative affect z-score from the sum of the SLSS and positive affect z-scores. Combining the dimensions of well-being into a composite SWB indicator variable in this manner is consistent with past research on the DFM (Suldo & Shaffer, 2008; Suldo et al., 2016; Xiong et al., 2017), the conceptual model underlying the DFM, and the correlations observed among the SWB dimensions (absolute value of r = .32 to .34). All regression analyses controlled for classroom teacher and included the main effects for SWB and IEB as well as their interaction, and thus we could test whether there were effects of one factor (e.g., SWB), after controlling for the other factor (e.g., IEB), and test whether the effects of one factor depended on the other factor (e.g., SWB had a stronger effect on the outcome in the presence of elevated IEB). For all analyses, statistical significance was determined using an alpha level of .05.

Rates of missing data were low for all student-report measures and teacher ratings of IEB (the 1-page SIBS and SEBS for the entire class). But for the TSRI, three teachers chose not to provide ratings of their relationship with any of the students in their classroom (N = 34 across teachers) and one teacher rated only two of her eight students. Also, EvsD-T scores were missing for 9 students from two teachers of 19 participants. Thus, analyses which utilized the TSRI or EvsD-T were limited to 137 and 169 participants, respectively.

Results
Preliminary Analyses
Descriptive statistics for all variables are displayed in Table 2. Correlation coefficients calculated to examine the relations between continuous study variables are presented in Table 3. Regarding the associations between positive and negative indicators of mental health, the aggregate SWB variable was not significantly correlated with either form of IEB: internalizing (r = -

.11, p = .15) or externalizing (r = -.11, p = .14). Externalizing and internalizing behaviors were significantly correlated with classmate support, teacher relationship satisfaction, and instrumental help (r ranged from -.18 [internalizing behaviors and classmate support] to -.61 [externalizing behaviors and teacher relationship satisfaction]). Externalizing behaviors were inversely correlated with all indicators of engagement, and internalizing behaviors were linked to teacher ratings (but not student ratings) of behavioral and emotional engagement, ranging from -.17 (student-reported emotional engagement) to -.52 (teacher-rated behavioral engagement). Regarding social relationships, SWB was significantly correlated with students' support perceived from teachers (r = .25) and classmates (r = .46), but not with the teacher-rated relationship variables. SWB was significantly associated with higher levels of both dimensions of engagement, whether rated by students (r = .37 [behavioral] and .52 [emotional]) or teachers (r = .20 [emotional] and .24 [behavioral]).

Mental Health Groups Yielded Through a Dual-Factor Model of Mental Health
Participants' scores on measures of SWB and IEB were used to determine the number of participants in each of the four anticipated mental health status groups (see Table 4). Participants were initially classified according to IEB levels, defined according to gender-specific distribution of SIBS and SEBS sum scores. Participants were identified as symptomatic (or not) based on elevated levels of internalizing behaviors (SIBS), externalizing behaviors (SEBS), or both. Prior utilization of these measures identified cut scores indicating clinically elevated (termed "at risk"; SIBS = teacher-rated score ≥ 8; SEBS = teacher-rated score ≥ 9) or "no risk" for IEB (SIBS= score < 4 SEBS= score < 5; Hartman et al., 2017); SIBS and SEBS scores of 4-7 and 5-8, respectively, indicated "on the radar" symptom levels. Using those cut scores for at-risk, 16.9% of Hartman et al.'s sample of mostly 1st and 2nd grade students (70% of 156 participants) had elevated SIBS or SEB scores.

When we applied those cut scores to the current sample of children in 4th and 5th grade, far fewer students (6.2%) were identified with at-risk/elevated IEB (2.2% for internalizing [3 girls and 1 boy] and 4.5% for externalizing [0 girls and 8 boys]). Thus, cut scores were augmented to reflect corresponding percentages of participants that would be identified as elevated due to having a T score ≥ 60 (i.e., top 16% of a distribution), often viewed as discrepant from typical levels (T < 60; bottom 84% of a distribution).

Table 2. Means, standard deviations, ranges, skew, and kurtosis of variables

Variable	N	M	SD	Skewness	Kurtosis
Dimensions of Mental Health					
Subjective Well-Being*	178	0.002	2.26	-0.98	1.03
Life Satisfaction	178	4.78	0.80	-0.69	-0.05
Positive Affect	178	4.18	0.77	-1.25	1.55
Negative Affect	178	1.70	0.72	1.43	2.28
Externalizing Behaviors	178	1.95	2.81	1.44	1.23
Internalizing Behaviors	178	1.29	2.04	1.91	3.39
Social Outcomes (Student report)					
Teacher Support	178	5.32	0.69	-1.53	2.61
Classmate Support	178	4.24	1.17	-0.51	-0.52
Social Outcomes (Teacher report)					
Relationship Satisfaction	137	4.69	0.48	-1.64	2.31
Instrumental Help	137	3.68	1.08	-0.43	-0.72
Academic Outcomes (Student report)					
Behavioral Engagement	178	3.41	0.42	-0.61	0.00
Emotional Engagement	178	3.35	0.48	-0.56	-0.63
Academic Outcomes (Teacher report)					
Behavioral Engagement	169	3.16	0.78	-0.56	-0.81
Emotional Engagement	169	3.35	0.65	-0.90	0.17

Note. *= indicates z-score which was utilized in the subsequent analyses. This score was comprised of standardized values for the sum of life satisfaction and positive affect minus negative affect.

Specifically, for girls, SIBS and SEBS cut scores of ≥3 and ≥3 identified 17.02% ($N = 16$) and 15.96% ($N = 15$) of participants as having elevated levels of internalizing and externalizing behaviors, respectively. Four girls (4.25%) had both elevated internalizing and externalizing behavior. In sum, cut scores of ≥3 identified a total of 28.72% ($N=27$) of girl participants with elevated IEB. For boys, SIBs and SEBs cut scores of ≥4 and ≥7 for internalizing and externalizing behaviors, respectively, identified 16.67% ($N = 14$) and 16.67% ($N = 14$) of participants with elevated levels of internalizing and externalizing behaviors, respectively. Six boys (7.14%) had both elevated internalizing and externalizing behaviors. In sum, cut scores of ≥4 and ≥7 identified a total of 26.19% ($N = 22$) of boy participants with elevated IEB. Applying these gender-specific cut scores to the total sample of 178 students, 16.85% ($N = 30$) met the criteria for elevated internalizing behavior, 16.29% ($N = 29$) met the criteria for elevated externalizing behaviors, 5.62% ($N = 10$) had elevated scores for both internalizing and externalizing behaviors, and 27.53% ($N = 49$) met criteria for elevated IEB (either internalizing, externalizing, or both). Conversely, 72.47% ($N = 129$) had low to average levels of IEB ($T < 60$ on both internalizing and externalizing).

Published norms for SWB do not exist. Decisions regarding cut scores for SWB were mirrored with proportion of students identified as elevated or low/average IEB. A SWB composite score (i.e., life satisfaction, positive affect, negative affect) corresponding to the 27.5th percentile was utilized as the cut score. Participants with scores below the 27.5th percentile were categorized as low SWB ($N = 49$), while those at or above the 27.5th percentile were categorized as average to high SWB (72.47%; $N = 129$). This method potentially allows for each participant with elevated IEB to also have low SWB (reflecting a traditional, medical view of mental health, and not forcing students into the Vulnerable or Symptomatic But Content groups solely due to identifying different proportions of participants as low SWB or elevated IEB). Table 1 summarizes the cut scores for IEB and SWB used to assign participants to mental health groups.

The distribution of students into the four mental health groups did not differ by demographic factors, as suggested by results from chi-square analyzes conducted to determine which demographic variables to include as covariates in subsequent analyses. No significant differences were found across the four mental health groups with respect to gender ($p = .94$); parent marital status (parents married or not; $p = .51$); race ($p = .96$); or SES (free/reduced-price lunch status; $p = .94$). However, significant differences across each of the four mental health groups were found for grade, $\chi^2 (3) = 13.56$, $p < .01$, V = .28, and teacher, $\chi^2 (39) = 69.83$, $p < .01$, V = .36, which supports our decision to control for classroom

(and effectively individual teachers) when making statistical comparisons of the mental health groups. Controlling for individual teachers also in essence controlled for grade level, as each teacher in this elementary school instructed specific grades (i.e., 4th or 5th) within their own individual classrooms.

Complete Mental Health Group. A total of 96 children (54% of sample) scored in the low to average range on teacher-rated internalizing ($M = 0.46$, $SD = 0.82$) and externalizing behaviors ($M = 0.97$, $SD = 1.76$) and reported average to high levels of SWB ($M = 1.00$, $SD = 1.12$). Proportions of the total sample and each specific mental health group that are distributed across gender, ethnicity, and socio-economic status categories are displayed in Table 4.[1]

Vulnerable Group. A total of 33 children (18.5% of sample) scored in the low to average range on teacher-rated internalizing ($M = 0.52$, $SD = 0.83$) and externalizing behaviors ($M = 1.06$, $SD = 1.89$) and reported diminished SWB ($M = -2.80$, $SD = 1.74$).

Symptomatic But Content Group. Another 33 children (18.5% of sample) scored in the elevated range on teacher-rated internalizing ($M = 2.88$, $SD = 2.30$) and/or externalizing behaviors ($M = 4.15$, $SD = 3.31$) and reported average to high SWB ($M = 1.51$, $SD = 1.22$).

Troubled Group. A total of 16 children (9% of sample) scored in the elevated range on teacher-rated internalizing ($M = 4.63$, $SD = 2.99$) and/or externalizing behaviors ($M = 5.13$, $SD = 3.69$) and reported diminished SWB ($M = -3.29$, $SD = 1.64$).

Differences in IEB Between DFM Mental Health Groups

A general linear model (GLM) using unique sums-of-squares and controlling for teacher effects revealed a significant effect for mental health group membership on levels of externalizing behaviors, $F (3, 161) = 19.18$, $p < .001$. Tukey-Kramer tests indicated that, as expected given how groups were formed, groups defined by elevated IEB (i.e., Symptomatic But Content, Troubled) had significantly more externalizing behaviors when compared to groups defined by low IEB (i.e., Complete Mental Health, Vulnerable). There were no additional differences, either between the pair of groups with low IEB, or between the pair of groups with high IEB. There was a significant effect for mental health group membership on levels of internalizing behaviors, $F (3, 161) = 35.32$, $p < .001$. As expected, groups defined by elevated IEB had significantly more internalizing behaviors in comparison to groups defined by low IEB. Notably, the Troubled group had more internalizing behaviors than the Symptomatic But Content group ($d =$

1.17). There was not a significant difference between groups with low IEB. In sum, Vulnerable students did not appear to have sub-threshold levels of either internalizing or externalizing behaviors, and Troubled students were characterized by higher levels of internalizing behaviors than peers in any other mental health group.

Differences in Social Outcomes Between Mental Health Groups

Student perceived teacher support. Adjusted and unadjusted means for each group on each social outcome are displayed in Table 5, along with results of follow-up Tukey-Kramer tests. A GLM using unique sums-of-squares and controlling for teacher effects revealed a significant effect for mental health group membership on levels of teacher support, $F (3, 161) = 4.22$, $p < .01$. The same pattern of statistical differences between mental health groups was observed for unadjusted and adjusted mean scores. Symptomatic But Content students perceived greater social support from teachers, in comparison to their peers with low SWB (i.e., Vulnerable ($d = .65$) or Troubled children ($d = .86$). The Complete Mental Health group had greater perceptions of teacher support than the Troubled group ($d = .66$) but did not differ significantly from the Vulnerable group.

Student perceived classmate support. A GLM using unique sums-of-squares and controlling for teacher effects revealed a significant effect for mental health group membership on levels of classmate support, $F (3, 161) = 14.18$, $p < .001$. Mean scores for groups with average to high SWB were greater than the mean scores for groups with low SWB: the Complete Mental Health group perceived more support than the Vulnerable group ($d = .99$), and the Symptomatic But Content group perceived more support than the Troubled group ($d = 1.15$). No differences were detected between groups with the same level of SWB (but different IEB).

Teacher perceived relationship satisfaction. A GLM using unique sums-of-squares and controlling for teacher effects revealed a significant effect for mental health group membership on levels of teacher perceived relationship satisfaction, $F (3, 123) = 8.50$, $p < .001$. Groups with low IEB had higher mean scores than those students with elevated IEB: relationship satisfaction was higher for the Complete Mental Health group than the Symptomatic But Content group ($d = .94$) and higher for the Vulnerable group compared to the Troubled group ($d = 1.37$). There were no significant differences between groups with the same level of IEB but different SWB.

Table 3. Correlations between variables in study

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Subjective Well-Being	—													
2. Life Satisfaction	.77*	—												
3. Positive Affect	.74*	.34*	—											
4. Negative Affect	-.76*	-.39*	-.32*	—										
5. Externalizing Behaviors	-.11	-.09	-.04	.12	—									
6. Internalizing Behaviors	-.11	.00	-.08	.17*	.44*	—								
7. Teacher Support	.25*	.24*	.26*	-.06	-.13	.00	—							
8. Classmate Support	.46*	.31*	.42*	-.31*	-.22*	-.18*	.50*	—						
9. TSRI—Instrumental Help	.16	.09	.17*	-.09	-.27*	-.35*	.08	.13	—					
10. TSRI—Satisfaction	.12	.08	.07	-.12	-.61*	-.40*	.17*	.23*	.38*	—				
11. Behavioral Engage-SR	.37*	.36*	.21*	-.26*	-.23*	-.06	.24*	.23*	.20*	.24*	—			
12. Emotional Engage-SR	.52*	.35*	.46*	-.35*	-.17*	-.14	.39*	.48*	.13	.12	.61*	—		
13. Behavioral Engage-TR	.24*	.27*	.16*	-.11	-.52*	-.34*	.18*	.13	.42*	.55*	.45*	.29*	—	
14. Emotional Engage-TR	.20*	.19*	.14	-.11	-.48*	-.51*	.16*	.14	.50*	.56*	.37*	.25*	.83*	—
15. Total IEB	-.13	-.06	-.07	.17*	.90*	.79*	-.09	-.24*	-35*	-.60*	-.19*	-.18*	-.52*	-.57*

Note. SR = Student Report. Engage = Engagement. TR= Teacher Report. IEB = Internalizing and Externalizing Behaviors
*p < .05.

Teacher perceived instrumental help. A GLM using unique sums-of-squares and con-trolling for teacher effects revealed a significant effect for mental health group membership on levels of teacher perceived instrumental help, $F(3, 123) = 3.42$, $p < .001$. Similar to findings with relationship satisfaction, groups with low IEB had higher mean scores than groups with elevated IEB (Complete Mental Health vs. Symptomatic But Content, $d = .85$; Vulnerable vs. Troubled, $d = 1.11$), with no differences between groups with the same level of IEB but different SWB.

Continuous variable analyses. Table 5 also contains results from regression analyses, specifically the main effects of SWB and IEB and their interaction, when regressed on each variable. After controlling for the main effect of the total IEB score, classroom (teacher), and the interaction between IEB and SWB, the main effect of SWB reached statistical significance across the two student-report variables—perceived teacher support, $t(161) = 2.30$, $p = .023$, $\eta^2_{sp} = .02$, and classmate support, $t(161) = 4.93$, $p = $ <.001, $\eta^2_{sp} = .10$. The main effect of IEB on student perceived teacher support was not significant ($p > .05$). The two social variables without significant main effects of SWB (teacher perceived relationship satisfaction and instrumental help; $p > .05$) were negatively associated with total IEB score, $t(123) = -7.94$, $p = $ <.001, $\eta^2_{sp} = .23$, and $t(123) = -2.21$, $p = .029$, $\eta^2_{sp} = .02$, respectively. This pattern of findings mirrors results from between-group analyses. In an exception, higher IEB scores predicted lower student perceived classmate support, $t(161) = -2.63$, $p = .009$, $\eta^2_{sp} = .03$, indicating a main effect of IEB when examined as a continuous variable (an effect not seen in comparisons of groups with the same level of SWB but different level of IEB).

Table 4. Mental health group distribution by demographic characteristics

	Mental Health Group				
	Complete Mental Health (*n* =96)	Vulnerable (*n* = 33)	Symptomatic But Content (*n* = 33)	Troubled (*n* = 16)	Total Sample (*N* = 178)
Demographic Variable	%	%	%	%	%
Gender					
Male	47.90	49.50	42.43	50.00	47.20
Female	52.10	51.50	57.57	50.00	52.80
Ethnicity*					
White	61.11	51.52	60.47	75.00	60.47
African American	5.56	6.06	3.03	0.00	4.65
Hispanic	21.11	30.30	21.21	12.50	22.09
Asian	3.33	3.33	3.03	0.00	2.91
Multiracial	8.99	9.09	12.12	12.50	9.88
Free/Reduced Lunch*	44.22	42.42	48.48	43.75	43.60
Age (Years old)	9.63	9.79	9.97	10.25	9.78

Note. *N = 172 due to missing data for ethnicity and Free/Reduced Lunch data..

Differences in Academic Engagement Between Mental Health Groups

Student-rated behavioral engagement. Adjusted and unadjusted means for each group on each rating of student engagement are displayed in Table 5, along with results of follow-up Tukey-Kramer tests. A GLM using unique sums-of-squares and controlling for teacher effects revealed a significant effect for mental health group membership on levels of perceived behavioral engagement, $F(3, 161) = 7.85$, $p < .001$. The same pattern of statistical differences between mental health groups was observed with unadjusted or adjusted means. Symptomatic But Content students reported more behavioral engagement than their peers also with elevated IEB but with low SWB (i.e., Troubled students; $d = 1.04$). The difference in mean scores between groups with low IEB (but different SWB) was not significant, but the Complete Mental Health group had greater behavioral engagement than Troubled students ($d = 1.10$).

Student-rated emotional engagement. A GLM using unique sums-of-squares and controlling for teacher effects revealed a significant effect for mental health group membership on levels of perceived emotional engagement, $F(3, 161) = 18.96$, $p < .001$. The same pattern of statistical differences between mental health groups was observed with unadjusted or adjusted means. The mean emotional engagement scores for groups with average to high SWB were greater than the mean scores in groups with low SWB: Complete Mental Health vs. Vulnerable, $d = 1.09$; Symptomatic But Content vs. Troubled, $d = 1.64$. For groups with the same level of SWB (but different IEB level), no mean differences were apparent.

Teacher-rated behavioral engagement. A GLM using unique sums-of-squares and controlling for teacher effects, revealed a significant effect for mental health group membership on levels of teacher-rated behavioral engagement, $F(3, 152) = 12.02$, $p < .001$. Groups with low IEB had higher behavioral engagement ratings than groups with elevated IEB: Complete Mental Health vs. Symptomatic But Content, $d = .90$; Vulnerable vs. Troubled, $d = 1.29$. There were no significant differences in behavioral engagement between groups with different levels of SWB (but same level of IEB). When adjusted means were examined, the pattern of statistical differences between mental health groups was the same with one exception: the Vulnerable and Symptomatic But Content groups were not different ($p = .12$).

Teacher-rated emotional engagement. A GLM using unique sums-of-squares and controlling for teacher

effects revealed a significant effect for mental health group membership on levels of teacher-rated emotional engagement, $F(3, 152) = 20.31$, $p < .001$. Similar to findings with teacher-rated behavioral engagement, students in groups with low IEB were rated higher on emotional engagement than students in groups with elevated IEB: Complete Mental Health vs. Symptomatic But Content, $d = 1.23$; Vulnerable vs. Troubled, $d = 1.76$. There were no significant differences in emotional engagement between groups with different SWB levels (but same IEB levels).

Continuous variable analyses. After controlling for the main effect of the total IEB score, classroom, and the interaction between IEB and SWB, the main effect of SWB reached significance across all four indicators of engagement, with higher SWB predicting greater: student-rated behavioral, $t(161) = 4.49$, $p = <.001$, $\eta_{sp}^2 = .09$, and emotional engagement, $t(161) = 5.29$, $p = <.001$, $\eta_{sp}^2 = .11$, as well as teacher-rated behavioral $t(152) = 3.46$, $p = <.001$, $\eta_{sp}^2 = .04$, and emotional engagement, $t(152) = 2.38$, $p = .019$, $\eta_{sp}^2 = .02$. This pattern of findings mirrors results from between-group analyses for student-rated engagement, but not teacher-rated engagement. Specifically, regression analyses reveal a main effect of SWB on all indicators of engagement- including teacher report measures- when SWB is examined as a continuous variable; these positive, additive effects of SWB on teacher-rated student engagement were not detected in comparisons of groups with the same level of IEB but different level of SWB. The main effect of total IEB score also reached significance across all four indicators of engagement, with lower IEB predicting greater: student-rated behavioral, $t(161) = -3.11$, $p = 002$, $\eta_{sp}^2 = .04$, and emotional engagement, $t(161) = -2.31$, $p = .022$, $\eta_{sp}^2 = .02$, as well as teacher-rated behavioral, $t(152) = -8.05$, $p = <.001$, $\eta_{sp}^2 = .24$, and emotional engagement, $t(152) = -9.15$, $p = <.001$, $\eta_{sp}^2 = .26$. This pattern of findings mirrors results from between-group analyses for teacher-rated engagement, but not student-rated engagement. Regression analyses revealed a main effect of IEB on all indicators of engagement- including student report measures- when IEB is examined in its continuous form; these negative, additive effects of IEB on student-rated engagement were not detected in comparisons of groups with the same level of SWB but different level of IEB.

Finally, after controlling the main effects of SWB and IEB, and teacher, the interaction between SWB and IEB was a significant predictor of teacher-rated behavioral engagement, $t(152) = -2.16$, $p = .032$, $\eta_{sp}^2 = .02$. An

interaction graph of the associations between IEB and behavioral engagement at SWB values 1 *SD* above and below the mean indicated that the positive effect of SWB was most pronounced at the lowest levels of IEB, and as the levels of IEB increased the positive effects of SWB diminished and became negligible.

Discussion

Findings from prior published studies with samples of U.S. students in middle school, high school, and college have supported the idea that examining SWB alongside IEB provides a more comprehensive picture of psychological functioning. Findings from the current study provide support for the utility of a DFM of mental health when applied to American elementary-aged youth. A majority of children in this study had low IEB that co-occurred with average to high SWB and were thus classified with a Complete Mental Health status. Of the students identified with relatively elevated internalizing or externalizing problems per teacher report (27.% of current sample), a minority (16 of 49; 32.7% of students with elevated IEB) also reported low SWB and classified as having a Troubled mental health status at the time of data collection. When cross-tabulating factors reflecting wellness and problems, two other groups were identified: Vulnerable youth (low SWB despite low IEB) and Symptomatic But Content (high SWB concurrent with elevated IEB), in line with increased awareness that IEB and SWB are distinct yet interrelated constructs (Keyes, 2005; 2009). Given that traditional screening methods emphasize IEB, the two most interesting groups may be these latter groups as the youth described as having Complete Mental Health or a Troubled status would be identified by a traditional problem-focused measure. The subsequent paragraphs describe the unique social and educational functioning associated with a Vulnerable or Symptomatic But Content status, which underscore the need to also evaluate SWB to gain a full understanding of student mental health.

Distribution and Features of Students across DFM Mental Health Groups

The majority of our sample (about 54%) of 4th and 5th grade children were classified as Complete Mental Health (high SWB and low IEB), whereas 9% were classified as Troubled (low SWB and elevated IEB). The Vulnerable (low SWB and low IEB) and Symptomatic But Content (high SWB and elevated IEB) groups each comprised of 18.5% of this U.S. sample of children. Prior research has identified about half to two-thirds of youth

(47% to 78% of a given sample) with Complete Mental Health (e.g., Antaramian, 2015; Antaramian et al., 2010; Eklund et al., 2011), a profile unlikely to require supplemental psychological services. In the present study, children who were from diverse ethnic/racial groups, SES groups, and parent marital status configurations were equally likely to belong to the Complete Mental Health group. The consideration of both well-being and IEB provides clarity about other groups of youth that are not flourishing and could be in need of targeted services.

The Vulnerable and Symptomatic But Content groups each comprised about one-fifth of children. Prior studies of U.S. adolescents that used the same methodology to form mental health groups identified about 11-13% of samples with these unique mental health profiles (Suldo & Shaffer, 2008; Suldo et al. 2016). Renshaw and Cohen (2014) identified 19% of college students as Vulnerable when SWB was indexed by life satisfaction only. The current study did not provide support for the notion that Vulnerable students—who are relatively unhappy yet lack mental health problems—might have a subclinical level of problems; instead, the mean number of IEB observed among this group was statistically similar to levels observed by their peers with Complete Mental Health, suggesting that the Vulnerable group may be purely distinguished by diminished SWB. In prior research, proportions of youth classified as Symptomatic But Content youth vary from 11 to 17% of adolescent samples (Antaramian et al., 2010; Suldo & Shaffer, 2008; Suldo et al., 2016), but only 4 to 5% of young adults (Eklund et al., 2011; Renshaw & Cohen, 2014). In the current study, the Symptomatic But Content children had levels of externalizing symptoms equivalent to their Troubled peers, but fewer internalizing behaviors. These findings are consistent with Greenspoon and Saklofske's (2001) notion that Symptomatic But Content children with high SWB are more likely to manifest externalizing than internalizing forms of IEB, and also in line with Doll's (2008) assertion that internalizing behaviors may be more dependent on the presence or absence of SWB. About one-tenth of elementary school children in this study had the most deleterious mental health profile— Troubled—characterized by problematic levels of both youth-reported SWB and teacher-perceived IEB (externalizing behaviors as seen in the Symptomatic But Content group, but also the greatest likelihood of internalizing behaviors).

Table 5. Mean values classroom relationships and student engagement by DFM mental health group and factor

Social (SR)	Mental Health Group										Main Effects		Inter-action
	CMH (N = 96)		Vulnerable (N = 33)		SBC (N = 33)		Troubled (N = 16)		Total (N = 178)		SWB	IEB	action
	M	SD	M	SD	M	SD	M	SD	M	SD	p	p	p
Teacher Support	$5.40_{a,b}$ (5.42)	.69	$5.09_{a,c}$ (5.15)	.72	5.53_b (5.43)	.51	4.95_c (4.87)	.81	5.32	.69	.02*	.08	.91
Classmate Support	4.54_a (4.55)	1.06	3.48_b (3.53)	1.05	4.57_a (4.63)	1.02	3.34_b (3.17)	1.24	4.24	1.17	<.001*	<.01*	.96
Social (TR)	CMH (N= 74)		Vulnerable (N = 27)		SBC (N = 27)		Troubled (N = 9)		Total (N = 137)				
Relationship Satisfaction	4.84_a (4.76)	.31	4.74_a (4.71)	.40	4.42_b (4.42)	.58	4.13_b (4.07)	.79	4.69	.48	.83	<.001*	.94
Instrumental Help	3.98_a (3.76)	.98	3.75_a (3.59)	1.03	3.13_b (3.40)	1.01	2.64_b (2.89)	1.02	3.68	1.08	.33	.03*	.84
Student Eng (SR)	CMH (N = 96)		Vulnerable (N =33)		SBC (N = 33)		Troubled (N = 16)		Total (N = 178)				
Behavioral Engagement	$3.49_{a,c}$ (3.52)	.40	$3.29_{a,b,c}$ (3.33)	.35	3.47_a (3.46)	.42	3.05_b (3.00)	.46	3.41	.42	<.001*	<.01*	.17
Emotional Engagement	3.48_a (3.49)	.41	3.02_b (3.06)	.38	3.53_a (3.52)	.39	2.84_b (2.79)	.60	3.35	.48	<.001*	.02*	.80
Student Eng (TR)	CMH (N = 91)		Vulnerable (N = 31)		SBC (N = 32)		Troubled (N = 15)		Total (N = 169)				
Behavioral Engagement	3.40_a (3.34)	.65	3.23_a (3.13)	.80	2.77_b (2.72)	.78	2.33_b (2.20)	.56	3.15	.78	<.001*	<.001*	.03*
Emotional Engagement	3.58_a (3.54)	.46	3.52_a (3.45)	.54	2.91_b (2.91)	.69	2.56_b (2.47)	.70	3.35	.65	.02*	<.001*	.15

*Note. Externalizing and internalizing behaviors were rated by each student's classroom teacher. Tukey-Kramer comparisons were employed to analyze group means in cases of significant F tests. Significant differences between group unadjusted means are indicated by different letters. Means having the same subscript are not significantly different. The same significant differences were found when the adjusted means were compared. Dependent variable adjusted means are presented in parentheses. DFM = Dual-Factor Model. Eng = Engagement SR. = Student report. TR = Teacher ratings. CMH = Complete Mental Health. SBC=Symptomatic but Content. SWB = Subjective well-being. IEB = Internalizing and Externalizing Behaviors.

Prior studies have identified about 15% of samples of adolescents as Troubled (Suldo & Shaffer, 2008; Suldo et al., 2016). The current study is unique in its examination of elementary school children, and its use of teacher report of IEB. Regarding the former point, prior research demonstrates that the prevalence of mental illness and diminished life satisfaction tends to increase from childhood to adolescence (Merikangas et al., 2009; Tolan & Larsen, 2014). Regarding the latter, most prior applications of the DFM have examined samples from developmental levels that are more widely trusted to accurately report psychopathology symptoms. In contrast, reliable assessments of children's psychological problems often involve informant report, such as parent or teacher ratings of internalizing and externalizing behaviors.

Differences in Social and Academic Outcomes Between Mental Health Groups

In line with findings from prior research, we anticipated mental health groups with high SWB would have superior social and academic outcomes in relation to groups with comparable levels of IEB but diminished SWB. In both domains, associations between mental health and optimal adjustment varied according to the rater of a given outcome, especially in categorical analyses. Differences in student reports of classmate support were most closely associated with SWB level. Specifically mental health groups with average/high SWB perceived more classmate support as compared to groups with low SWB (with no differences between groups with similar levels of SWB), and in continuous variable analyses SWB accounted for 10% of the variability in classmate support versus 3% predicted by IEB. Regarding student-rated teacher support, students in groups with average to high SWB again perceived more support than Troubled students; SWB (but not IEB) was a unique predictor of perceived teacher support when mental health variables were examined in their continuous forms.

In contrast, differences in teacher-rated dimensions of the teacher-student relationship were most closely associated with student IEB and not tied to student SWB, in both categorical and continuous variable analyses. Prior use of the TSRI, albeit with teenagers, found teachers' perceptions of a positive teacher-student relationship strongly co-occurred with their perceptions of fewer student externalizing behaviors ($r = -.55$; and $r = -.30$ with teacher-rated internalizing behaviors) but were unrelated to student reports of their emotional wellness (life satisfaction) or internalizing behavior problems (Suldo et al., 2014). It is possible that students' noticeable symptoms of mental health problems may be

a primary (negative) contributor to the quality of teacher-student relationships as experienced by teachers (Ohan, Visser, Strain, & Allen, 2011).

Across social outcomes, a Complete Mental Health status was associated with the highest levels of social support from classroom sources as well as highest quality teacher-student relationships. While the direction of effects cannot be verified, this finding affirms the salience of mental health to students' social relationships in the classroom setting, with the greatest perceived classmate support reported by students who experienced high SWB in combination with low IEB. Consistent with prior research demonstrating positive associations between SWB and social outcomes, findings from this study suggest a possible protective role of SWB when elevated IEB are evident. Specifically, in comparison to the Troubled group, the Symptomatic But Content group perceived higher levels of social support from both teachers and peers. This is consistent with Greenspoon and Saklofske's (2001) finding that Canadian Symptomatic But Content children perceived better relationships with teachers and classmates as compared to Troubled students. The strong classroom relationships may make possible these students' high SWB even in the face of elevated IEB. Conversely, the positive mindsets that characterize happy people may lead to perhaps overappraisals of social support. Although the direction of the effects is unknown, findings from the current study document desirable social outcomes associated with high SWB, above and beyond contributions of IEB.

With regard to academic engagement, we found that differences in student-rated emotional engagement were most closely associated with SWB (e.g., unique variance accounted for by SWB and IEB was 11% vs 2%, respectively) whereas teacher-rated emotional engagement was most closely associated with IEB (26% and 2% explained by IEB and SWB, respectively). Convergence between teacher and student reports of emotional engagement was low ($r = .25$), perhaps due to the internal nature of the construct. Students may be the most accurate reporter of their enthusiasm and interest in the classroom, but further research with direct observations of classroom behavior may help clarify discrepant findings. The trend in findings for differences in student-rated behavioral engagement was similar (e.g., engagement of Symptomatic But Content students was greater than Troubled students) but the positive effect of SWB was less pronounced in the case of low IEB. Of note, in continuous variable analyses both mental health factors significantly predicted behavioral engagement as rated by teachers and students. Still, only the Complete

Mental Health group (vs. Vulnerable) had greater behavioral engagement than Troubled students. These findings extend the list of positive outcomes associated with high SWB (with or without elevated IEB) during elementary school, especially with regard to emotional engagement in the classroom which is a key dimension of student engagement (Reschly et al., 2017) and predicts growth in academic performance (e.g., writing skills) during the elementary years (Hosan & Hogland, 2017).

Implications for Practice

This study contributes to the literature base on the Dual-Factor Model of Mental Health (Suldo & Shaffer, 2008) by providing insight into its application to American elementary school-aged youth. Results were consistent with prior published studies (Greenspoon & Saklofske, 2001; Suldo et al., 2016) that demonstrate students with Complete Mental Health often have the most favorable social and academic adjustment, in comparison to their peers in other mental health groups. In this study, elementary school children with Complete Mental Health had greater student-rated emotional engagement in the classroom and perceived more classmate support. Even among students traditionally deemed at-risk due to elevated IEB, the presence of SWB (a Symptomatic But Content status) was associated with better adjustment as manifested in higher levels of teacher and classmate support, and student-rated behavioral and emotional forms of student engagement. There were also adjustment advantages associated with low IEB, as evidenced by better teacher-student relationships and academic engagement when rated by teachers. Given that the development of healthy interpersonal relationships and classroom engagement are critical to ultimate school success (Baker, 2006; Henry et al., 2012; Ladd & Dinella, 2009), study findings provide additional evidence that comprehensive assessment of children's mental health is dependent upon multiple factors, emphasizing the necessity of attending to SWB in addition to IEB within educational and clinical practice. Data from both positive and traditional negative indicators should provide school mental health providers with fuller information regarding a given student's level of risk and need for supports. Further, school mental health providers should consider schoolwide programs and practices that direct attention to students' SWB (e.g., Wingate, Suldo, & Peterson, 2018), to complement the historical emphasis on preventing, identifying, and treating IEB in school-based mental health practices.

Limitations and Suggestions for Future Research

This study provided an initial application of the DFM to U.S. elementary school students. The sample was diverse in terms of ethnic and socioeconomic features, but modest in size and further reduced for analysis of outcomes that required data from teachers. This study merits replication with a larger sample drawn from multiple communities (e.g., multiple schools and geographic regions), which would increase generalizability and estimation precision, while also providing ample power for significance tests that incorporate alpha adjustments to compensate for the multiple comparisons. Also, this study assessed only 4th and 5th grade students; whereas future studies should include a more comprehensive elementary school sample (e.g., K-5) to permit a fuller investigation of potential age group differences in percentages of youth in each quadrant. The current study is also limited through the cross-sectional design. Variables conceptualized as outcomes (classroom relationships, student engagement) may actually be predictors of mental health status. Longitudinal studies with repeated measurements that afford examinations of the stability of mental health group status over time, along with academic and social adjustment, are warranted. Future studies of elementary school students may also improve upon the current study by gathering multiple informants' perceptions of youth IEB, especially for internalizing behaviors which may be difficult for teachers to fully recognize in children (Cunningham & Suldo, 2014). To enhance generalizability of results, future studies should use measures of IEB with national norms available to inform cut scores for elevated psychopathology, particularly given that the size of each mental health group can shift substantially depending on how high or low levels of either factor are defined. A final limitation pertains to how students were classified into mental health groups, as continuous variables were dichotomized in primary analyses. Students near a cut score are particularly susceptible to misclassification due to measurement error that may lead to an altered decision of mental health status. However, methods used in this study mirror routine procedures in school-based clinical practice (e.g., T score ≥ 60 on a screening measure indicates risk) and the methodologies used in previous studies of the DFM (Antaramian et al., 2010; Suldo et al., 2016; Suldo & Shaffer, 2008). Future research into the DFM might advance more sophisticated methods that permit more nuanced assessment of mental health throughout developmental periods.

Conclusions

The current study enhanced the understanding of the Dual-Factor Model of Mental Health among elementary school students. Many students (56%) met sample-specific criteria for Complete Mental Health, and about 37% of children were identified with a unique mental health status that cannot be recognized through assessment of IEB alone. One such status is Symptomatic But Content, which illustrates that average to high SWB is possible even among children with elevated IEB (especially problems of an externalizing vs. internalizing nature). Symptomatic But Content students do not appear to be as at-risk as their Troubled peers (a group distinguished by more internalizing behaviors) given their relatively positive perceptions of classroom relationships and levels of emotional and behavioral engagement in the classroom. The other unique mental health group— Vulnerable—directs attention to children who may be overlooked if mental health had been narrowly conceptualized in terms of IEB alone. Vulnerable students may warrant further consideration for targeted supports due to their elevated risk for diminished classmate support and emotional engagement in the classroom. Pending replication of findings with larger K-5 samples, findings from this study align with the notion that a deficit-focused approach focused on IEB is unlikely to provide the most accurate view of student mental health. The mere lack of elevated IEB does not translate to the presence of high SWB, and both components of mental health (IEB and SWB), have additive effects on classroom relationships and academic engagement.

Declaration of Conflicting Interests

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Notes

[1]To examine the sensitivity of the emergence of four groups to the cut score used to identify students as having elevated IEB, we examined the distribution of students into quadrants using more extreme cut scores. When the SIBS and SEBS cut scores for "at-risk" advanced by Hartman et al. (2017) were applied to the current sample, along with an SWB composite corresponding to the 6.18th percentile (z score = -4.20), each quadrant still had at least one student. The distribution of students to groups was as follows: 88.2% Complete Mental Health,

5.6% Vulnerable, 5.6% Symptomatic But Content, and 0.6% Troubled. These results demonstrate that low SWB is not synonymous with high IEB even when the latter is particularly elevated.

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