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ADAPTING THE DUAL-FACTOR MODEL FOR UNIVERSAL SCHOOL- BASED MENTAL HEALTH SCREENING

Bridging the Research to Practice Divide^{1,2}

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The perspective that mental health encompasses a balance of wellness–health and distress–illness has deep historical roots in applied psychology. Jahoda (1958), widely cited, made prescient observations more than 60 years ago discussing *positive psychology* and noting that mental health is a human value and right. Some 40 years ago, Veit and Ware (1983) operationalized this concept in the *Mental Health Inventory*, as a measure of psychological distress and well-being intended for use with general, not clinical populations. Ryff’s (1989) vital contributions formulated a subjective well-being (SWB) model that incorporated hedonic (emotional) and eudemonic (psychological and social) dimensions. Following these pioneering efforts and building on Seligman and Csikszentmihalyi’s (2000) positive psychology resurgence in the late 1990s, Greenspoon and Saklofske (2001) contributed the paper, *Toward an Integration of Subjective Well-Being and Psychopathology*, that inspired essential, meaningful research under the mental health *dual-factor system* concept. Building on this research, Suldo and Shaffer (2008) further explored the dual-factor system and contributed the paper, *Looking Beyond Psychopathology: The Dual-Factor Model of Mental Health in Youth*. This research specialization is uniquely pertinent to school practices grounded in positive psychology (Seligman et al., 2009) and positive education principles (Waters & Loton, 2019). It recognizes the value of a balanced mental health conceptualization and, at its inception, considered school-aged children’s perspectives.

Despite its intuitive appeal and a body of research examining the dual-factor mental health model, it is not yet validated as a practical application for applied school mental health practice—this is a pressing need. It is crucial because there are increasing calls for the standardization of measures and procedures for educational research. As exemplified by the United States Institute of Education Sciences requirement, all grant submissions must include common measures to support cross-study comparisons (Schneider, 2020). The current chapter proposes and presents evidence

validating a practical dual-factor approach for universal school-based mental health screening and monitoring, an unrealized aspiration, and a critical social and educational imperative (Catalano & Kellogg, 2020).

School Mental Health Context and Need

Informal psychosocial screening occurs in all schools every day. When a school staff member notices a child looking down, or not playing or interacting with their schoolmates, they check-in with the student. Moreover, even if a child is not visibly down, scared, or anxious, school staff often check-in with students: “How are you doing?” “Is everything okay?” In such circumstances, the school staff focuses on, monitors, and attends to each student’s needs. They informally assess whether the child feels well or is generally getting along with their schoolmates and their school work is progressing. In general, they are concerned about whether the child is doing “well.” This watch, care, response sentiment happens informally on school campuses every day. Reflective of the overall reasoning behind informal screening and check-ins at school, the purpose of universal screening is to offer a way to more formally, carefully, and systematically conduct check-ins for all students. The emphasis on checking in on *all* students is further emphasized due to the known systematic biases in schools and the cultural mismatch between school staff and students (Raines et al., 2009). Specific subgroups of students may be more or less likely to be attended to when relying solely on school staff to randomly check in on students, further highlighting the need for a systematic approach to asking all students how they are doing. Such an effort should include a way to assess whether each child has experienced recent distress. It should also advance a way to monitor positive psychosocial development (Is a student’s life going well?) while limiting potential referral biases (Weathers, 2019).

A formal school-based screening and monitoring process grounded in positive psychology principles is not designed to recognize distinct types of psychological and social problems. Instead, its primary purpose is to alert school staff about the need to follow up with vulnerable students and find out more about their experiences than is readily available via direct observation (Dowdy et al., 2015). Moreover, a secondary purpose is to provide information that helps school staff support youth who are generally doing well and help them thrive and reach their optimal development levels (Kim et al., 2014). Universal monitoring is ideally implemented within a multitiered comprehensive student health and wellness plan (Moore et al., 2019).

Balanced Mental Health Models

In designing and executing comprehensive school mental wellness programs and services that include universal wellness screening and monitoring, educators require validated measures that produce information relevant to all students’ social and emotional well-being. Various scholars have advocated incorporating strength-based measures (e.g., Nickerson & Fishman, 2013) in a balanced mental health screening approach that considers emotional distress indicators and optimal well-being (e.g., Keyes, 2013). This approach takes a whole child, whole-school approach, identifying personal assets and social resources that foster positive youth development. Screening optimally should provide information about all youth who could benefit from specialized services. It

is also vital to support all youths' growth toward higher well-being levels. The dual-factor mental health approach fits this balanced, complete mental health perspective (Antaramian et al., 2010).

The dual-factor approach is related to and influenced by complementary balanced mental health frameworks. For instance, the Diagnostic and Statistical Manual for Mental Disorders (DSM; American Psychiatric Association, 2013) includes mental health disorder symptom lists. However, the DSM also evaluates symptomatology juxtaposed with global functioning. An individual would not necessarily be given a diagnosable disorder if the associated symptoms did not have a corresponding adverse impact on an individual's capacity to live life to a reasonable capacity. Similarly, Keyes (2005, 2006) proposed the dual continua model (DCM) grounded in Ryff's robust multidimensional well-being framework (Ryff & Keyes, 1995), as a way to examine the balance across affective, psychological, and social well-being. In the DCM, an individual has complete mental health when their well-being profile suggests frequent weekly or daily experiences of positive affect and favorable judgments of experiencing their personal and social life.

Dual-Factor Mental Health

As Seligman and Csikszentmihalyi (2000) called to expand positive psychology research and practice, efforts to evaluate balanced mental health paradigms advanced. Greenspoon and Saklofske (2001) articulated a mental health approach that simultaneously considered co-distributions of well-being levels and psychopathology symptoms. In their model, full or complete mental health is the balance of high life satisfaction and low mental ill-health symptoms. In adapting what Greenspoon and Saklofske named a *dual-factor system*, Suldo and Shaffer (2008) used the term *dual-factor model* (DFM), which has been used in most subsequent research (Antaramian et al., 2010; Grych et al., 2020; Kelly et al., 2012; Lim et al., 2021; Lyons et al., 2012, 2013; Zhou et al., 2020). For presentation convenience, we use DFM in the remainder of this chapter.

Greenspoon and Saklofske's Dual-Factor Model Prototype

Greenspoon and Saklofske's (2001) main premise was that if a dual-factor conceptualization had promise, then groups logically formed by crossing scores on both factors should present significantly different psychosocial profiles. Their goal was to create representative groups of students with varying levels of life satisfaction and pathology. Figure 5.1 shows Greenspoon and Saklofske's prototype dual-factor framework. One group had high life satisfaction with low psychopathology, exemplars of positive mental health (Group 1). A second group included students with low life satisfaction and high internalizing distress, exemplars of students with mental health challenges (Group 2). A third group had students with low life satisfaction and low psychological distress (Group 3), and the last group in this prototypic model comprised students who counterintuitively reported high levels of life satisfaction while also reporting elevated distress symptoms (Group 4).

| | |
|---|--|
| Group 3 Low Subjective Well-Being Low Pathology | Group 2 Low Subjective Well-Being High Pathology |
| Group 1 High Subjective Well-Being Low Pathology | Group 4 High Subjective Well-Being High Pathology |

Figure 5.1 Greenspoon and Saklofske (2001) Prototypic Dual-Factor Model Groups

Dual-Factor Model

Greenspoon and Saklofske’s (2001) prototypical DFM intimates that the data analyses contrasted all four DFM groups. However, this was not the case. Figure 5.2 represents their two central analyses. For Analyses A and B, the 40-item *Multidimensional Life Satisfaction Scale* (MSLSS; Huebner, 1994) total score assessed a wellness satisfaction factor. The analyses employed different sample-specific cut-scores to create three life satisfaction levels (low, mid, and high) to maximize cross-group differentiation and to produce the group sizes needed for the analysis. Analysis A compared DFM Groups 1, 2, and 3, as shown in Figure 5.1. Group 2 included children’s self-report of internalizing distress using the internalizing problems composite score of the *Behavior Assessment System for Children Self-Report of Personality* (BASC SRP; Reynolds & Kamphaus, 1992). Group 3 students (low internalizing distress and low life satisfaction) served as a comparison. This analysis included only the subset of students who reported *low or high life satisfaction* and *low or high internalizing symptoms*—it excluded 42% of the sample in the middle. Analysis B was conceptually similar but used a behavioral disorder measure to form Group 3; in this instance, the *Behavior Assessment System for Children Teacher Rating Scales* (BASC TRS; Reynolds & Kamphaus, 1992) hyperactivity subscale rating was used. Different BASC cut-scores identified *low* (bottom 35%) and *high* (top 35%) *hyperactivity*. This analysis excluded the middle 30% of children’s BASC responses. Students with *high hyperactivity* ratings and *high life satisfaction* (Group 4) were the Analysis B comparison group. Psychopathology was defined differently in each analysis using gender *t*-scores, published, or sample-specific distributions.

| Analysis A | | BASC Student Self-Report Internalizing (PTH) | | |
|------------|----------------------|--|----------------|--|
| | | retained 40% | dropped 20% | retained 40% |
| MSLSS | Low retained 40% | Group 3 Low LS–Low PTH <i>n</i> = 30 | Sample Omitted | Group 2 Low LS–High PTH <i>n</i> = 104 |
| | dropped 20% | <i>n</i> = 170 (42%) excluded "...to offer the best balance between retaining cases and highlighting group differences (Greenspoon & Saklofske, 2001; p. 87) | | |
| | High retained 40% | Group 1 High LS–Low PTH <i>n</i> = 103 | | |

| Analysis B | | BASC Teacher Report Hyperactivity (PTH) | | |
|------------|----------------------|--|----------------|--|
| | | retained 35% | dropped 30% | retained 35% |
| MSLSS | Low retained 35% | Sample Omitted | | Group 2 Low LS–High PTH <i>n</i> = 65 |
| | dropped 30% | <i>n</i> = 345 (68%) excluded, "...the 35/30/35 split appeared superior while retaining a sufficient number of cases." (Greenspoon & Saklofske, 2001; p. 92) | | |
| | High retained 35% | Group 1 High LS–Low PTH <i>n</i> = 53 | | Group 4 High LS–High PTH <i>n</i> = 44 |

Figure 5.2 Representation of the Greenspoon Saklofske (2001) Primary Data Analyses

The Greenspoon and Saklofske (2001) article contributed substantially to research by stressing the importance of considering positive mental health indicators and symptomatology indicators. Their two analyses showed that prototypic well and unwell mental health groups differed on a range of characteristics, including locus of control and quality of interpersonal relationships. Having stated this, Greenspoon and Saklofske’s exploratory study used (a) measures selected post facto from a more extensive assessment battery and (b) sample-specific distribution cut-score values to optimize group differences. This study did not specifically test a full DFM framework inclusive of the entire sample. Furthermore, it would be challenging to replicate this study. The students were young, Grades 3–5, and responded to a research questionnaire that took 150 minutes over two days to complete. As a proof of concept exploratory study, this study had a substantial impact. However, it had limited implications for school practice and did not inform universal school mental health screening or monitoring in practical ways.

Suldo and Shaffer (2008) Dual-Factor Model Adaptation

Suldo and Shaffer (2008) provided meaningful, substantial contributions by expanding on Greenspoon and Saklofske’s (2001) pioneering work. They proposed and tested an integrated DFM that simultaneously created and contrasted all four prototypic groups. Figure 5.3 shows the Suldo and Shaffer DFM adaptation. An SWB index comprised the wellness factor (*Student Life Satisfaction Scale* [SLSS; Huebner, 1991] and *Positive and Negative Affect Scale* [PANAS; Laurent et al., 1999]). An SWB composite was created by generating sample-specific z-scores for the SLSS,

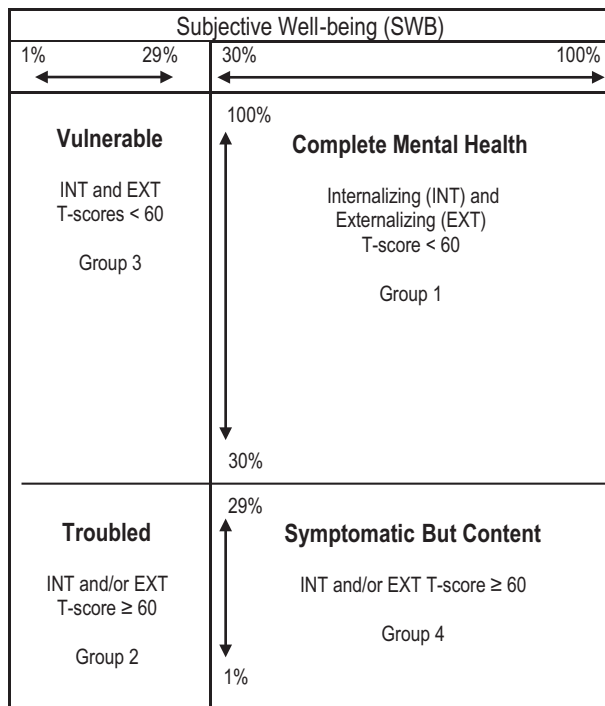


Figure 5.3 Suldo and Shaffer (2008) Modified Dual-Factor Model

Dual-Factor Model

PANAS positive, and PANAS negative ($[zSLSS-zPANAS-P]-[zPANAS-N]$). As in Greenspoon and Saklofske (2001), the sample-specific SWB distribution was used to select a cut-score that produced cell sizes sufficient to allow for the chosen data analysis.

The *Achenbach scales* (Child Self-Report of internalizing symptoms and the Teacher Report of externalizing symptoms; Achenbach & Rescorla, 2001) measured psychopathology. Published norms established cut-scores for internalizing and externalizing disorders. Here, students with *t*-scores of 60 or higher (top 15%) on either the internalizing (student self-report) or externalizing (teacher report) measures were assigned into the high symptom category. Across both measures, about 30% of students were symptom positive. Referencing this symptom proportion, low and high SWB groups were formed by designating the approximate bottom 30% on the sample SWB distribution to *low SWB*, and the top 70% to *average/high SWB*. As shown in Figure 5.3, the DFM groups' arrangement differed from Greenspoon and Saklofske (2001), and Suldo and Shaffer contributed the descriptive labels for each group employed in most subsequent DFM studies: Complete Mental Health, Troubled, Vulnerable, and Symptomatic but Content.

Dual-Factor Model Proof of Concept

Following from the Suldo and Shaffer (2008) analysis, an impressive research body has further examined the DFM (e.g., Antaramian et al., 2010; Grych et al., 2020; Kelly et al., 2012; Lyons et al., 2012, 2013; Zhou et al., 2020). These studies contribute to the proof of concept of the value of considering symptoms and wellness, which provide researchers and practitioners with a richer understanding of youth's psychosocial development. Differences among dual-factor mental health groups have been identified across developmental periods (e.g., children [Smith et al., 2020], adolescents in middle [e.g., Antaramian et al., 2010] and high school [Suldo et al., 2016], and adults [e.g., Renshaw & Cohen, 2014]) and quality of life indicators. Across investigations, individuals with high well-being and low psychopathology (complete mental health) experience the most favorable outcomes. For example, adolescents with complete mental health had superior engagement (Antaramian et al., 2010; Lyons et al., 2013; Smith et al., 2020), academic achievement (Antaramian et al., 2010; Lyons et al., 2013), social skills (Suldo et al., 2016), physical health (Suldo & Shaffer, 2008; Suldo et al., 2016), identity development (Suldo et al., 2016), and social support (Smith et al., 2020). That youth with complete mental health experience more positive outcomes than vulnerable youth indicates that the absence of psychopathology is insufficient in realizing positive outcomes (e.g., Antaramian et al., 2010). Further, in the presence of distress, research has indicated that well-being can protect against negative outcomes—individuals with symptomatic but content mental health experience more favorable outcomes than youth with troubled mental health (e.g., Grych et al., 2020; Lyons et al., 2013; Smith et al., 2020; Suldo et al., 2016).

Overall, these various DFM studies show robust differences in outcomes between groups with similar pathology levels, but different levels of SWB. Additionally, this approach's prototypical complete mental health and troubled groups are significantly different on numerous quality of life indicators. As proof of concept, there is a sufficient body of knowledge to support the core DFM principle that an optimal assessment of youth mental health is ground by considering distress and wellness factors simultaneously.

Dual-Factor Model Limitations for Universal School Mental Health Screening

Notwithstanding DFM's substantial contributions, research has not yet developed a standard procedure that facilitates the measurement of its factors simultaneously. Even more pressing, it has

not bridged the science to practice gap. The DFM, as examined in research studies, is not readily accessible by school mental health professionals. Research-employed measures and algorithms are not easily translated for use in individual student case assessment or universal school-wide screening and monitoring. Among DFM's limitations are:

- 1 the measures have too many items for universal screening applications,
- 2 studies rely on sample-specific distribution procedures that practitioners could not readily replicate,
- 3 studies have not examined the joint distribution of co-normed wellness and distress factors,
- 4 a consensus is not established on the cut-scores to create groups, and
- 5 the approach is not yet tested and validated in the context of actual tier 1 school-wide wellness screening.

Another critical limitation is that previous DFM research has adopted Greenspoon and Saklofske's (2001) 2×2 prototypic model. This practice seems to have been driven by the need for studies with modest sample sizes to have large enough cell sizes for analyses. Consequently, positive well-being or life satisfaction has typically included students in the upper 70%–75% of the sample's distribution (e.g., Suldo & Shaffer, 2008, Suldo *et al.*, 2016) meaning that some study participants on the positive end of the wellness factor actually had below-average, but not low, SWB.

A Step toward Bridging the Science to Practice Gap

The remainder of the chapter contributes to research by addressing the DFM limitations mentioned above. We first describe the dataset we draw upon for this purpose. We then propose and test a modified 3×3 DFM that expands understanding of students whose emotional distress experiences and wellness declarations fall in between what Suldo and Shaffer (2008) prototypically named *Troubled* and *Complete Mental Health* groups. An overall goal is to offer a standardized DFM approach that provides increased uniformity across research efforts. Simultaneously, the approach should be practical enough for psychologists to use it in their work with individual students (case studies) and to monitor students' well-being in the whole-school context.

Data Source

The current chapter's analyses used the responses of 8,017 high school students. They attended one of 15 high schools located in nine counties randomly selected from California high schools. The students completed the *California Healthy Kids Survey* (CHKS), a biennial state-wide survey that anonymously monitors student risk behaviors and resilience factors, and a supplementary module that included DFM measures. Students were enrolled in Grades 9–12 and most identified as female (51.6%) and non-Latinx (51.4%). This sample was diverse for traditional racial group identification: White (36.0%), multiple group identity (34.6%), Asian (10.7%), American Indian-Alaskan Native (5.5%), Black (3.8%), Native Hawaiian-Pacific Islander (2.1%), and declined to respond (7.2%). Most of these students reported that they resided with their parents/guardians (91.3%) whose modal educational degree attainment was a four-year college degree (36.0%); 13.8% of parents did not complete high school.

Measures

Consistent with a DFM approach, measures simultaneously assessed symptoms of wellness and distress. Scores on these DFM measures were then plotted and combined to create a 3×3 DFM to provide a system easily used by practitioners to classify all students. To examine and

Dual-Factor Model

provide validity information in support of this approach, several additional measures were co-administered. Specifically, we aimed to evaluate how students in the various 3×3 groups differed with respect to behavioral functioning, perceived school safety, sense of school belonging, and social emotional strengths.

Dual-Factor Measures

WELLNESS FACTOR

In principle, DFM does not require the use of any specific wellness factor measure. Past DFM research with adolescents used Huebner's (1991) SLSS (e.g., Antaramian et al., 2010; Lyons et al., 2012; Suldo & Shaffer, 2008; Suldo et al., 2016) and Diener et al.'s (1985) *Satisfaction with Life Scale* (e.g., Grych et al., 2020; Xiong et al., 2017). In the context of universal DFM monitoring, we followed Greenspoon and Saklofske's (2001) original approach and used the multidimensional life satisfaction measure, in this instance the *Brief Multidimensional Students' Life Satisfaction Scale* (BMSLSS; Huebner et al., 2006). Our rationale is that it (a) is brief (six items) and (b) touches on multiple life domains, not just global life satisfaction. The BMSLSS assesses satisfaction for five general life domains: *friends, family, self, living environment*, and most relevant to universal screening, *school*. Research evidence supports its internal consistency among high school students ($\alpha = 0.81$; Zullig et al., 2001). Convergent validity is documented with the Multidimensional Students' Life Satisfaction Scale ($r = 0.69$, Seligson et al., 2003, 2005; $r = 0.62$). Factor analyses support a single factor structure (Seligson et al., 2003, 2005). In the current application, the responses options were: 0 = *strongly dissatisfied*, 1 = *moderately satisfied*, 2 = *mildly dissatisfied*, 3 = *mildly satisfied*, 4 = *moderately satisfied*, and 5 = *strongly satisfied* (see Table 5.1). Sum scores range from 0 to 25, with higher scores indicating greater life satisfaction.

SYMPTOM OR DISTRESS FACTOR

Most dual-factor studies use comprehensive symptom measures, including the Youth Self-Report of the Self-Report of Personality form from the *Behavior Assessment System for Children, Second Edition* (BASC-2; Reynolds & Kamphaus, 2004; used by Suldo et al., 2016) and the *Child Behavior Checklist* (CBCL; Achenbach, 1991; used by Lyons et al., 2012). Although well-validated, these measures are inefficient and impractical for universal screening applications due to the costs and the high number of items. Hence, to evaluate a DFM approach applicable to universal screening, we recognized the need to develop and validate a brief, unidimensional distress measure complementing the BMSLSS. With this aim, we previously developed the *Social-Emotional Distress Survey-Secondary* (SEDS-S).

The SEDS-S asks students to rate internal psychological experiences related to sad (e.g., *in the past month, I felt sad and down*) and anxious (e.g., *I was scared for no good reason*) emotional experiences (see Table 5.1). Consonant with a screening efficiency principle, SEDS-S assesses overall emotional distress to prioritize and identify students for follow-up assessment and support services. To develop the tool, we examined the clinical literature and longer measures of distress (e.g., Depression, Anxiety, and Stress Scales-21; Lovibond & Lovibond, 1995) with the goal of capturing internalizing, as opposed to externalizing behaviors (Dowdy et al., 2018), as they are often more difficult to detect within school settings (Kamphaus et al., 2014). We intentionally sought fewer items than existing pathology-focused screening measures and adopted language appropriate for adolescent students. Additionally, we designed the tool to ask about recent (i.e., past month) emotional experiences, as opposed to general life experiences, to support progress monitoring of functioning throughout a given school year. An initial study supported a unidimensional factor structure. Convergent validity was documented with significant positive

Table 5.1 Items, Response Format, and Psychometric Properties for the SEDS-S and BMSLSS

| | Female (n = 4154) | | Male (n = 3853) | | t | d |
|---|-------------------|------|-----------------|------|-------|-------------|
| | M | SD | M | SD | | |
| <i>Social Emotional Distress Scale</i> ^a (response range = 0–3) | | | | | | |
| I had a hard time breathing because I was anxious. | 1.13 | 1.14 | 0.55 | 0.96 | 24.48 | 0.55 |
| I worried that I would embarrass myself in front of others. | 1.47 | 1.16 | 1.00 | 1.09 | 18.50 | 0.42 |
| I was tense and uptight. | 1.26 | 1.10 | 0.82 | 1.02 | 18.99 | 0.41 |
| I had a hard time relaxing. | 1.44 | 1.14 | 0.98 | 1.10 | 18.48 | 0.41 |
| I felt sad and down. | 1.50 | 1.16 | 1.00 | 1.11 | 20.26 | 0.44 |
| I was easily irritated. | 1.71 | 1.10 | 1.16 | 1.09 | 22.25 | 0.50 |
| It was hard for me to cope and I thought I would panic. | 1.10 | 1.15 | 0.59 | 0.95 | 21.88 | 0.48 |
| It was hard for me to get excited about anything. | 0.97 | 1.05 | 0.76 | 1.00 | 9.14 | 0.20 |
| I was easily annoyed and sensitive. | 1.66 | 1.11 | 0.99 | 1.07 | 27.36 | 0.61 |
| I was scared for no good reason. | 0.96 | 1.10 | 0.54 | 0.93 | 18.32 | 0.41 |
| Total (0–30) | 13.21 | 8.67 | 8.38 | 7.62 | 26.38 | 0.59 |
| <i>Brief Multidimensional Life Satisfaction Scale</i> ^b (response range = 0–5) | | | | | | |
| Family | 3.57 | 1.45 | 3.74 | 1.38 | 5.59 | 0.12 |
| Friendships | 3.82 | 1.23 | 3.88 | 1.22 | 2.43 | 0.05 |
| School experience | 2.98 | 1.36 | 2.99 | 1.43 | 0.32 | 0.01 |
| Myself | 3.13 | 1.49 | 3.44 | 1.47 | 9.68 | 0.21 |
| Where I live | 3.61 | 1.38 | 3.69 | 1.39 | 2.76 | 0.06 |
| Total (0–25) | 17.01 | 5.15 | 17.74 | 5.22 | 5.56 | 0.14 |

Note: Males: SEDS-S skewness = 0.92, kurtosis = 0.86, $\alpha = 0.91$. Females: skewness = 0.28, kurtosis = -1.02, $\alpha = 0.93$. For total sample, BMSLSS $\alpha = 0.81$. $r_{\text{SEDS-BMSLSS}} = -0.52$ (females). $r_{\text{SEDS-BMSLSS}} = -0.47$ (males).

- a “In the past month...” Response options: 0 = not like me, 1 = a little like me, 2 = pretty much like me, and 3 = very much like me.
- b “These questions ask about your satisfaction with different areas of your life.” Response options: 0 = strongly dissatisfied, 1 = moderately dissatisfied, 2 = mildly dissatisfied, 3 = mildly satisfied, 4 = moderately satisfied, and 5 = strongly satisfied.

relations between the overall SEDS-S score and anxiety and depression symptoms as measured by the Generalized Anxiety Disorder -7 scale (Spitzer et al., 2006) and the Patient Health Questionnaire-9 (Kroenke et al., 2001), respectively (Dowdy et al., 2018). A second study with a diverse sample of California high school students ($N = 72,740$) replicated a one-factor structure with strong reliability ($\alpha = 0.93$ and $\Omega = 0.95$; Furlong et al., 2021). Sum scores for the SEDS-S range from 0 to 30, with higher scores indicating greater distress.

DFM Validation Measures

California Healthy Kids Survey

The California Healthy Kids Survey (CHKS, 2017; <https://calschls.org>) is a surveillance survey of school climate and safety, student wellness, and youth resiliency administered biennially in California high school students. Behavioral risk, school safety, and school belonging items from

the CHKS were used to assess DFM group differences (see Table 5.2 or 5.3 note for items used in this chapter's analyses).

Social-Emotional Health Survey-Secondary

The Social-Emotional Health Survey-Secondary-2020 (SEHS-S-2020; Furlong et al., 2021) was used to explore how students' perceptions of their internal assets and external resources differed across DFM categories. Research supports a three-level model: one general factor model with four domains and 12 subscales (three items per subscale) that load onto the four domains: *belief in self* (self-awareness, persistence, and self-efficacy), *belief in others* (school support, family coherence, and peer support), *emotional competence* (empathy, self-control, and behavioral self-control), and *engaged living* (gratitude, zest, and optimism). The response options were: 0 = *not at all true*, 1 = *a little true*, 2 = *pretty much true*, and 3 = *very much true*. Confirmatory factor analysis (CFA) and measurement invariance (Furlong et al., 2021; You et al. 2014, 2015) provide validity and reliability evidence. Internal response consistency evidence is favorable for the SEHS-S-2020 domains ($\alpha_{\text{range}} = 0.87\text{--}0.94$, $\Omega_{\text{range}} = 0.87\text{--}0.94$; Furlong et al., 2021).

A Proposed 3 × 3 Dual-Factor Model for Universal Screening

In this section, we propose and evaluate a modification of Suldo and Shaffer's (2008) DFM with a large sample using jointly administered measures of distress and life satisfaction and applying a common cut-score strategy. This consideration is extended to explore more deeply a matter that has been underexamined in the DFM research. Harkening back to the original study conducted by Greenspoon and Saklofske (2001), their analysis excluded students in the middle ranges between what they defined as low and high symptomatology and low and high life satisfaction. When applied in most other DFM studies, these middle groups were unexamined. This chapter contributes to DFM research by exploring whether and how the quality of life indicators of students who fall in middle distress and middle life satisfaction ranges compared to their lower and higher student counterparts. The following sections describe the sequential steps we took to refine, standardize, examine, and provide validity evidence for a 3 × 3 DFM for school-wide, universal mental wellness screening and monitoring.

Evaluate DFM Measures' Validity

Recognizing that any DFM classification approach initially hinges on the psychometric properties of the measures used to create the classification system, it is critical to first evaluate the validity evidence supporting score inferences to be made from the DFM measures. For use with universal monitoring, DFM measures should optimally have several characteristics. Measuring DFM factors and creating mental health categories should be a standardized, uniform procedure in which any sample's responses can be compared directly to any other sample. This procedure should also facilitate the comparison of individual students' responses over time. Such an approach should be brief to facilitate screening and provide an efficient, easy to calculate and interpret index. The measures should be unidimensional with strong psychometric properties, and the distress and wellness factors should be validated together (i.e., co-administered to the same large, norming population) so that their joint distribution is known. For maximum utility, the DFM measures should have invariance across gender and ethnic groups.

As an example, in this illustration, we used the BMSLSS and SEDS-S. However, we recognize that other measures that meet similar standards can also create a DFM classification. Previous research has demonstrated that both the BMSLSS (Seligson et al., 2003, 2005) and the SEDS-S are unidimensional (Dowdy et al., 2018; Furlong et al., 2021). For this illustration, these two measures were

Table 5.2 Dual-Factor Category Differences on Quality of Life Indicators for Females

| <i>Brief Multidimensional Student Life Satisfaction Scale (BMSLSS)</i> | | | | | | | | | |
|--|----------------------|----------------|-----------------|----------------------|----------------|-----------------|----------------------|----------------|-----------------|
| | <i>(A) High</i> | | | <i>(B) Mid</i> | | | <i>(C) Low</i> | | |
| | <i>(A) Low</i> | <i>(B) Mid</i> | <i>(C) High</i> | <i>(A) Low</i> | <i>(B) Mid</i> | <i>(C) High</i> | <i>(A) Low</i> | <i>(B) Mid</i> | <i>(C) High</i> |
| | <i>SEDS Distress</i> | | | <i>SEDS Distress</i> | | | <i>SEDS Distress</i> | | |
| AA | AB | AC | BC | BA | BB | BC | CA | CB | CC |
| 1442 | 328 | 169 | 440 | 367 | 256 | 382 | 233 | 382 | 537 |
| 34.7% | 7.9% | 4.1% | 10.6% | 8.8% | 6.2% | 9.2% | 5.6% | 9.2% | 12.9% |
| <i>Dual-Factor Model 3 x 3 Group ID N%</i> | | | | | | | | | |
| <i>Quality of Life Indicators (N)</i> | | | | | | | | | |
| <i>Demographics</i> | | | | | | | | | |
| ^a Youth of color (non-White) (4059) | 54.2% | 55.2% | 61.5% | 56.7% | 58.4% | 50.4% | 64.8% | 55.9% | 51.1% |
| Odds ratio 95% CI compared with AA | — | 0.67–1.11 | 0.95–1.83 | 1.08–1.60 | 1.01–1.52 | 0.69–1.09 | 1.66–3.19 | 1.13–2.03 | 0.88–1.39 |
| ^b Identifies other than straight (3826) | 7.2% | 14.1% | 24.5% | 11.3% | 25.2% | 29.9% | 18.9% | 32.7% | 41.4% |
| Odds ratio 95% CI compared with AA | — | 1.38–3.19 | 2.70–6.43 | 1.15–2.31 | 3.17–5.87 | 3.95–7.61 | 1.92–4.63 | 4.29–9.03 | 6.65–12.40 |
| <i>Emotional Risk</i> | | | | | | | | | |
| ^c YRBS sadness item (4134) | 12.1% | 46.5% | 67.3% | 31.0% | 59.0% | 86.3% | 43.5% | 75.2% | 91.6% |
| Odds ratio 95% CI compared with AA | — | 3.9–6.9 | 11.6–23.9 | 2.0–3.2 | 10.3–16.5 | 30.3–57.8 | 3.6–7.2 | 13.0–24.7 | 58.2–129.3 |
| ^d YRBS suicide item (4143) | 3.8% | 17.1% | 30.4% | 10.5% | 26.2% | 45.7% | 21.9% | 36.9% | 64.2% |
| Odds ratio 95% CI compared with AA | — | 2.1–5.0 | 6.9–16.0 | 2.0–4.2 | 7.6–14.5 | 16.7–32.7 | 3.8–9.1 | 12.4–26.1 | 35.2–69.4 |
| <i>Behavioral Risk</i> | | | | | | | | | |
| ^e 30-day marijuana use (3516) | 5.2% | 10.4% | 10.1% | 12.5% | 15.7% | 15.8% | 22.2% | 24.2% | 25.2% |
| Odds ratio 95% CI compared with AA | — | 1.23–3.21 | 1.01–3.40 | 1.51–3.12 | 2.26–4.56 | 2.60–5.54 | 2.28–5.62 | 3.67–8.19 | 4.37–8.69 |
| ^f 30-day alcohol use (3505) | 10.5% | 18.2% | 19.6% | 12.3% | 19.9% | 19.0% | 27.4% | 27.2% | 24.0% |
| Odds ratio 95% CI compared with AA | — | 1.35–2.85 | 1.28–3.21 | 1.13–2.05 | 1.89–3.35 | 1.80–3.42 | 1.37–3.09 | 2.30–4.68 | 1.99–3.67 |

Dual-Factor Model

| | | | | | | | | | | | |
|------------------------------|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--------------|
| <i>Safety, Victimization</i> | | | | | | | | | | | |
| g | Feels safe at school (4142) | 73.5% | 67.7% | 63.9% | 52.6% | 48.4% | 44.1% | 39.4% | 38.8% | 28.5% | 0.334 |
| | Odds ratio 95% CI compared with AA | — | 0.50–0.86 | 0.43–0.82 | 0.34–0.50 | 0.26–0.39 | 0.23–0.36 | 0.15–0.27 | 0.14–0.25 | 0.08–0.14 | |
| | ^h Made fun of teased (4151) | 10.5% | 22.9% | 30.8% | 17.3% | 25.6% | 41.2% | 18.9% | 34.0% | 49.8% | 0.318 |
| | Odds ratio 95% CI compared with AA | 1.64–3.06 | 2.56–5.19 | 1.09–1.84 | 2.33–3.79 | 4.67–7.79 | | 0.69–1.64 | 2.58–4.82 | 5.12–8.47 | |
| <i>School Belonging</i> | | | | | | | | | | | |
| i | Feel I am part school (4117) | 70.0% | 62.4% | 59.2% | 43.3% | 41.6% | 45.3% | 26.6% | 26.3% | 20.1% | 0.382 |
| | Odds ratio 95% CI compared with AA | — | 0.54–0.91 | 0.49–0.96 | 0.23–0.34 | 0.20–0.31 | 0.20–0.31 | 0.14–0.25 | 0.08–0.15 | 0.06–0.10 | |
| j | Enjoy work with classmates (4397) | 68.4% | 60.6% | 57.1% | 44.6% | 46.7% | 38.4% | 30.8% | 26.0% | 26.4% | 0.331 |
| | Odds ratio 95% CI compared with AA | — | 0.59–1.00 | 0.50–0.97 | 0.30–0.43 | 0.26–0.39 | 0.19–0.30 | 0.10–0.20 | 0.11–0.20 | 0.10–0.17 | |

Note: The AA group reporting high life satisfaction and low emotional distress corresponds with the “complete mental health” label used in previous dual-factor model studies. BMSLSS = Brief Multidimensional Student Life Satisfaction Scale (Using the combined male and female sample: A = highest 50.2% to [approximately 50%–100%] of combined sample, B = middle 24.3% [approximately 26%–49%], and C = lowest 25.5% [approximately 1%–25%]). SEDS = Social Emotional Distress Scale for the female sample: (Low = bottom 50.2%, Mid = middle 24.3%, and High = top 25.5%, and most distress). Cramer’s V moderate to relatively strong effect sizes in bold. V effect size ranges = weak (0.10–0.19), moderate (0.20–0.39), relatively strong (0.40–0.59), strong (0.60–0.79), and very strong (0.80–1.0). Items shown in this table are from the California Healthy Kids Survey. Student responses collected during the 2017–2018 academic year.

- a “What is your race?” (44.7% reported White; youth of color identified as American Indian, Alaskan Native, Asian, Black, Native Hawaiian, Pacific Islander, or a multiple group identity).
- b Which of the following best describes you? (Other than straight youth identified as: gay or lesbian, bisexual, I am not sure yet, something else, or declined to respond).
- c During the past 12 months, did you ever seriously consider attempting suicide? (Percent responding yes).
- d During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more that you stopped doing some usual activities? (Percent responding yes).
- e During the past 30 days, on how many days did you use marijuana (smoke, vape, eat, or drink)? (Percent responding one or more days).
- f During the past 30 days, on how many days did you use one or more drinks of alcohol? (Percent responding one or more days).
- g How safe do you feel when you are at school? (Percent responding safe or very safe).
- h During the past 12 months, how many times on school property have you been made fun of, insulted, or called names? (Percent responding one or more times).
- i How strongly do you agree or disagree with the following statements? I feel I am part of this school. (Percent responding agree or strongly agree).
- j I enjoy working together with other students on class activities. (Percent responding pretty much true or very much true).

Table 5.3 Dual-Factor Category Differences on Quality of Life Indicators for Males

| Brief Multidimensional Student Life Satisfaction Scale (BMSLSS) | | | | | | | | | | | |
|---|-------|---------------|-------------|-----------|---------------|-------------|------------|-------------|--------------|--------------|--|
| | | (B) Middle | | | (C) Low | | | | | | |
| (A) High | | (A) Low | (B) Mid | (C) High | (A) Low | (B) Mid | (C) High | (A) Low | (B) Mid | (C) High | |
| SEDS Distress | | SEDS Distress | | | SEDS Distress | | | | | | |
| AA | AB | AC | BA | BB | BC | CC | CA | CB | CC | | |
| 1384 | 440 | 259 | 354 | 288 | 242 | 196 | 261 | 429 | | | |
| N % | 35.9% | 11.4% | 6.7% | 9.2% | 7.5% | 6.3% | 5.1% | 6.8% | 11.1% | V | |
| Dual-Factor Model 3 × 3 Group ID | | | | | | | | | | | |
| Quality of Life Indicators | | | | | | | | | | | |
| Demographics | | | | | | | | | | | |
| ^a Youth of color (3601) | 56.2% | 56.1% | 62.2% | 58.1% | 60.0% | 55.9% | 67.9% | 64.4% | 54.7% | 0.071 | |
| Odds ratio 95% CI compared with AA | — | 0.77–1.23 | 0.63–1.07 | 0.66–1.01 | 0.96–1.55 | 0.93–1.47 | 1.64–3.28 | 1.47–3.00 | 0.80–1.29 | | |
| ^b Identifies other than straight (3197) | 2.8% | 7.6% | 9.8% | 3.8% | 8.7% | 20.5% | 6.7% | 10.5% | 18.2% | 0.214 | |
| Odds ratio 95% CI compared with AAQ | — | 1.47–4.08 | 1.95–5.39 | 0.54–1.77 | 1.56–4.34 | 3.20–7.64 | 0.70–3.35 | 1.20–4.83 | 4.86–11.41 | | |
| Emotional Risk | | | | | | | | | | | |
| ^c YRBS sadness item (3833) | 5.2% | 20.6% | 39.5% | 11.4% | 31.9% | 62.9% | 17.0% | 38.5% | 70.9% | 0.521 | |
| Odds ratio 95% CI compared with AA | — | 3.39–6.58 | 8.41–16.75 | 1.55–3.50 | 6.05–12.01 | 21.63–43.85 | 2.39–5.78 | 8.04–16.00 | 32.23–60.65 | | |
| ^d YRBS suicide item (3843) | 1.3% | 9.2% | 19.0% | 4.8% | 14.6% | 35.5% | 8.8% | 22.0% | 45.2% | 0.426 | |
| Odds ratio 95% CI compared with AA | — | 4.55–14.04 | 10.15–31.06 | 1.55–5.38 | 7.35–22.92 | 24.46–71.23 | 3.68–14.23 | 12.33–37.04 | 37.83–103.31 | | |
| Behavior Risk | | | | | | | | | | | |
| ^e Marijuana use (3680) | 7.2% | 9.2% | 9.8% | 15.1% | 18.0% | 20.6% | 16.3% | 21.9% | 23.2% | 0.141 | |
| Odds ratio 95% CI compared with AA | — | 0.87–1.97 | 0.86–2.28 | 1.57–3.39 | 1.73–3.86 | 1.88–4.28 | 1.57–4.02 | 2.46–5.36 | 2.82–5.42 | | |

Dual-Factor Model

| | | | | | | | | | | |
|--|-------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--------------|
| ^f Alcohol use (3312) | 8.1% | 10.8% | 12.1% | 17.5% | 17.4% | 21.4% | 14.4% | 15.5% | 22.9% | 0.131 |
| Odds ratio 95% CI compared with AA | — | 0.93–2.00 | 0.99–2.43 | 1.66–3.44 | 1.61–3.50 | 2.08–4.53 | 1.17–3.06 | 1.36–3.16 | 2.43–4.61 | |
| <i>School Safety, Victimization</i> | | | | | | | | | | |
| ^g Feels safe at school (3831) | 76.0% | 70.3% | 63.4% | 58.4% | 52.3% | 47.9% | 44.1% | 43.7% | 35.1% | 0.302 |
| Odds ratio 95% CI compared with AA | — | 0.59–0.95 | 0.41–0.73 | 0.35–0.56 | 0.27–0.45 | 0.20–0.39 | 0.18–0.34 | 0.19–0.32 | 0.14–0.22 | |
| ^h Made fun of teased (3852) | 8.4% | 20.7% | 28.6% | 12.7% | 22.2% | 33.1% | 14.3% | 28.4% | 38.9% | 0.272 |
| Odds ratio 95% CI compared with AA | — | 2.11–3.84 | 3.14–6.08 | 1.10–2.29 | 2.23–4.37 | 3.88–7.49 | 1.17–2.83 | 3.11–6.01 | 5.31–9.14 | |
| <i>School Belonging</i> | | | | | | | | | | |
| ⁱ Feel I am part school (3824) | 69.4% | 61.2% | 63.7% | 42.7% | 42.0% | 41.4% | 25.1% | 30.6% | 26.5% | 0.341 |
| Odds ratio 95% CI compared with AA | — | 0.56–0.87 | 0.59–1.02 | 0.26–0.42 | 0.25–0.42 | 0.24–0.41 | 0.15–0.26 | 0.15–0.26 | 0.13–0.20 | |
| ^j Enjoy work with classmates (3837) | 74.1% | 71.1% | 76.7% | 46.5% | 47.9% | 41.4% | 36.4% | 40.0% | 35.9% | 0.326 |
| Odds ratio 95% CI compared with AA | — | 0.68–1.09 | 0.84–1.58 | 0.24–0.39 | 0.28–0.47 | 0.24–0.43 | 0.15–0.27 | 0.16–0.25 | 0.16–0.25 | |

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Note: The AA group reporting high life satisfaction and low emotional distress corresponds with the “complete mental health” label used in previous dual-factor model studies. BMSLSS = Brief Multidimensional Student Life Satisfaction Scale (Using the combined male and female sample: A = highest 50.2% to [approximately 50%–100%] of combined sample, B = middle 24.3% [approximately 26%–49%], and C = lowest 25.5% [approximately 1%–25%]). Social Emotional Distress Scale for the male sample: (Low = bottom 50.9%, Mid = middle 25.9%, High = top 23.2%, and most distress). Crammer’s V moderate to relatively strong effect sizes in bold. V effect size ranges = weak (0.10–0.19), moderate (0.20–0.39), relatively strong (0.40–0.59), strong (0.60–0.79), and very strong (0.80–1.0). Items shown in this table are from the California Healthy Kids Survey. Student responses collected during the 2017–2018 academic year.

- “What is your race?” (42.0% reported White; youth of color identified as American Indian, Alaskan Native, Asian, Black, Native Hawaiian, Pacific Islander, or a blended racial heritage).
- Which of the following best describes you? (Other than straight youth identified as: gay or lesbian, bisexual, I am not sure yet, something else, or declined to respond).
- During the past 12 months, did you ever seriously consider attempting suicide? (Percent responding yes).
- During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more that you stopped doing some usual activities? (Percent responding yes).
- During the past 30 days, on how many days did you use marijuana (smoke, vape, eat, or drink)? (Percent responding one or more days).
- During the past 30 days, on how many days did you use one or more drinks of alcohol? (Percent responding one or more days).
- How safe do you feel when you are at school? (Percent responding safe or very safe).
- During the past 12 months, how many times on school property have you been made fun of, insulted, or called names? (Percent responding one or more times).
- How strongly do you agree or disagree with the following statements? I feel I am part of this school. (Percent responding agree or strongly agree).
- I enjoy working together with other students on class activities. (Percent responding pretty much true or very much true).

co-administered to the same youth in our large sample so that we could examine their joint distribution. For the sample examined in this chapter's analyses, females and males reported comparable mean responses on the BMSLSS ($0.01 \leq d \leq 0.21$), with average item means ranging from 2.98 to 3.88 on the 0–5 response scale (see Table 5.1 for the BMSLSS items, response format, and psychometric properties). Internal consistency reliability for the BMSLSS was satisfactory ($\alpha = 0.81$). However, as expected on a measure of internalizing symptoms, females reported higher scores on the SEDS-S than males ($0.20 \leq d \leq 0.61$), with average total distress being significantly higher for females than males. Average item scores ranged from 0.55 to 1.16 for males and 0.96 to 1.71 for females on the 0–3 response scale (see Table 5.1 for SEDS-S items, response format, and psychometric properties). Internal consistency reliability for the SEDS-S was satisfactory for males ($\alpha = 0.91$) and females ($\alpha = 0.93$). In this large sample, the BMSLSS and SEDS-S total scores were correlated at -0.52 for females and -0.47 for males. Overall, we found that the SEDS-S and BMSLSS met the requirements needed to create a 3×3 DFM.

Determine Cut-Scores for Use in DFM

After examining the psychometrics of the measures used to create a 3×3 DFM, the next logical step was to determine cut-scores. Recognizing the myriad of limitations associated with cut-scores (Moore et al., 2019), we decided to examine cut-scores as a heuristic rather than a precise cut-point. This process is not considered a traditional cut-score obtained through receiver operating characteristic curve analyses with specific attention to sensitivity and specificity. Instead, the use of a cut-score heuristic recognizes that with these skewed distributions, many students are surrounding those cut-points. Hence, there is no clear binary indicator and no exact cut-score provided. This approach recognizes the overarching goal of universal screening, which does not aim to provide information sensitive enough for a discrete diagnosis. Instead, it aims to provide information that helps the school team take the next and look more in-depth into students' concerns. This approach recognizes that there are many reasons why a student might report relatively high distress, low life satisfaction, or both. A universal screener cannot be sensitive to the range of possible precipitating experiences and conditions. Nevertheless, it is not crucial in the universal screening context. The knowledge that a youth's life is not going well and that their responses place them in a zone indicative of distress is sufficient information to provoke follow-up action.

Cut-Scores in Previous DFM Research

Many previous DFM studies have relied on predetermined values as a decision point to assign students into DFM groups (e.g., raw scores, sample means, standard deviations, or *T*-scores; Antaramian et al., 2010; Kelly et al., 2012; Lyons et al., 2012; Suldo & Shaffer, 2008). Examples of frequently used risk measures include the *Child Behavior Checklist-Youth Self-Report* (CBCL-YSR, Achenbach & Ruffle, 2000; e.g., Antaramian et al., 2010; Lyons et al., 2012; Suldo & Shaffer, 2008), *Strength and Difficulties Questionnaire* (SDQ, Goodman, 1997; e.g., Thayer et al., 2021), and *Behavior Assessment System for Children-2 Self-Report of Personality* or *Teacher Rating Scales* (BASC-2 SRP and TRS; e.g., McMahan, 2012; Thalji, 2013). Students were classified into a high pathology (PTH) group if they had a *t*-score of 60 or higher on internalizing, externalizing, or both scales or their percentile rank was at or above the normed 70th percentile (high) or below (low). Studies have classified roughly 25%–30% of participants as having high PTH.

Concerning the life satisfaction factor, there is even less uniformity because there are no large-sample standardization norms for the measures employed (Grych et al., 2020; Suldo et al., 2016). Examples of strength-based instruments included in DFM studies are the combination of the SLSS and the *Positive Affect and Negative Affect Scale for Children* (e.g., Antaramian et al., 2010; McMahan, 2012; Suldo & Shaffer, 2008; Thalji, 2013), the SLSS alone (e.g., Lyons et al., 2012),

and the *Satisfaction With Life Scale* (SWLS; e.g., Grych et al., 2020). Previous DFM studies classified students as having either high or low SWB using a cut-point such as a mean item score of 4 on the SWB measure (e.g., 30% in low SWB; Suldo & Shaffer, 2008) or a score of 15 on the SWLS measure (e.g., 41% in low and 59% in high; Grych et al., 2020).

Many recent DFM studies have used a raw score that corresponds to the proportion of students classified as having high or low PTH or to the selected percentile of the distribution (e.g., 23.5%–27.5% in low SWB; McMahan, 2012; Smith et al., 2020; Thalji, 2013). Smith et al. (2020) used an SWB composite score corresponding to the 27.5th percentile as the cut-score; students with scores below the 27.5th percentile were categorized as having low SWB, while those at or above were categorized as having average to high SWB (72.5%). Gilman and Huebner (2006) also grouped students into low (bottom 20%), average (middle 50%; 25%–75%), and high (top 20%) using the SLSS global mean score distribution. In other studies (e.g., Antaramian et al., 2010; Lyons et al., 2012), the lowest 1 *SD* (bottom 15%) were designated as having low SWB, and the top 85% were designated as having high SWB. This same algorithm has been employed in subsequent DFM studies (Suldo et al., 2011; Xiong et al., 2017).

DFM 3 × 3 Cut-Scores

The selection of cut-scores in past DFM research has not been arbitrary; however, they have not been uniformly applied. Some consensus with regards to cut-scores is needed to facilitate the integration of DFM research across samples. Furthermore, within applied contexts, schools need a reasonable standard that they can use to evaluate the two DFM factors meaningfully, which does not fluctuate by the idiosyncratic variance in a given school context.

We propose a 25–25–50 cut-score approach using the known distributions of scores based on their distress (i.e., SEDS–S) and life satisfaction scores (i.e., BMSLSS) to categorize students into high (top 50%), medium (middle 25%), and low (lowest 25%) categories for a 3 × 3 DFM. SEDS–S scores between 0 and 9 are indicative of the lowest levels of distress (lowest 50%). Students with SEDS–S scores between 10 and 16 comprise about the next 25% of students and are placed in a middle range. The remaining about 25% of students report experiencing the highest levels of distress with scores on the SEDS–S between 17 and 30.³ The same logic is applied to create the 25–25–50 cut-score approach for life satisfaction. The largest group of students (approximately the top 50%) reported the highest levels of life satisfaction on the BMSLSS with scores in the 19–25 range. The middle 25% of students scored in the 15–18 range and were placed in a middle category, whereas the bottom 25% of students scored in the 0–14 range and reported the lowest levels of life satisfaction. Figures 5.4 and 5.5 provide cut-scores and the number of students placed in each of these categories based on responses by females and males, respectively. Specifically, the cell shading indicates cell size density. The numbers in each of the cells represent the number of students who had that exact score combination based on their distress and life satisfaction scores. Note also that the lines on Figures 5.4 and 5.5 show the cut-scores used to form the 3 × 3 DFM categories discussed in this chapter's previous sections.

This proposed 25–25–50 approach matches closely to past research (e.g., Suldo & Shaffer, 2008) with additionally providing information about youth in the middle ranges on indicators of distress and life satisfaction. Instead of removing students within the middle ranges to create a simplified 2 × 2, all students are included within this 3 × 3 DFM. This approach is compatible with the mission of schools to help all children learn and thrive and is also consistent with the aim of universal screening to provide actionable information for all students (Furlong et al., 2014). The 3 × 3 DFM supports efforts to understand and foster all students' positive development, including those experiencing nonoptimal health in the middle ranges. Recognizing that the 2 × 2 approach may be too simplistic to consider all youth, it is equally essential that any procedure not be overly

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| Female | | Social Emotional Distress Scale | | | | | | | | | | | | | | | | N | | | | | | | | | | | | | | | | | |
|----------------------------------|------------------|---------------------------------|-----|-----|-----|--------------------|-----|-----|-----|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|----|-----|----|-----|-----|-----|------|-----|----|
| | | Low (A) (50.9%) | | | | Middle (B) (25.9%) | | | | High (C) (23.2%) | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brief Multidimensional | High (A) (50.2%) | 25 | 45 | 14 | 11 | 10 | 14 | 9 | 12 | 4 | 8 | 4 | 4 | 4 | 3 | 3 | 2 | 3 | 2 | 1 | 2 | 1 | 1 | 2 | 3 | 1 | 1 | 1 | 1 | 9 | | | | | |
| Students Life Satisfaction Scale | | 31 | 16 | 22 | 16 | 22 | 10 | 13 | 5 | 6 | 2 | 6 | 3 | 4 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 173 | | | | | |
| | | 23 | 21 | 16 | 22 | 17 | 18 | 22 | 14 | 10 | 8 | 11 | 8 | 3 | 9 | 3 | 3 | 4 | 2 | 2 | 1 | 1 | 2 | 5 | 1 | 3 | 2 | 1 | 2 | 211 | | | | | |
| | | 22 | 16 | 12 | 20 | 26 | 20 | 14 | 22 | 18 | 14 | 16 | 15 | 11 | 9 | 7 | 9 | 6 | 2 | 4 | 2 | 4 | 5 | 5 | 2 | 4 | 1 | 1 | 2 | 269 | | | | | |
| | | 21 | 24 | 15 | 19 | 24 | 26 | 29 | 23 | 16 | 23 | 18 | 19 | 14 | 8 | 14 | 8 | 6 | 6 | 5 | 7 | 4 | 5 | 3 | 2 | 3 | 2 | 4 | 2 | 337 | | | | | |
| | | 20 | 29 | 19 | 21 | 26 | 27 | 20 | 28 | 23 | 21 | 18 | 17 | 21 | 18 | 16 | 14 | 18 | 7 | 10 | 5 | 7 | 5 | 10 | 10 | 4 | 7 | 5 | 2 | 418 | | | | | |
| | | 19 | 9 | 21 | 16 | 10 | 15 | 18 | 20 | 18 | 12 | 14 | 15 | 21 | 18 | 13 | 18 | 20 | 16 | 13 | 14 | 8 | 9 | 5 | 11 | 4 | 2 | 6 | 4 | 2 | 359 | | | | |
| | | 18 | 6 | 4 | 7 | 4 | 11 | 9 | 18 | 17 | 12 | 15 | 19 | 13 | 15 | 12 | 15 | 15 | 7 | 9 | 20 | 10 | 9 | 7 | 5 | 6 | 12 | 4 | 10 | 3 | 2 | 6 | 7 | 309 | |
| | | 17 | 3 | 3 | 8 | 7 | 6 | 13 | 6 | 9 | 14 | 18 | 8 | 17 | 10 | 11 | 14 | 13 | 14 | 11 | 12 | 9 | 5 | 4 | 6 | 9 | 9 | 6 | 4 | 6 | 6 | 4 | 271 | | |
| | | 16 | 2 | 1 | 3 | 2 | 6 | 3 | 7 | 10 | 10 | 8 | 16 | 7 | 12 | 11 | 10 | 10 | 9 | 7 | 22 | 10 | 15 | 8 | 10 | 4 | 5 | 11 | 2 | 5 | 9 | 1 | 4 | 240 | |
| | | 15 | 4 | 2 | 1 | 4 | 3 | 3 | 4 | 8 | 8 | 6 | 12 | 17 | 9 | 4 | 11 | 14 | 9 | 13 | 11 | 12 | 13 | 11 | 10 | 4 | 2 | 7 | 6 | 10 | 10 | 8 | 7 | 243 | |
| | | 14 | 1 | 1 | 2 | 4 | 5 | 3 | 7 | 2 | 6 | 7 | 5 | 11 | 9 | 11 | 6 | 10 | 14 | 10 | 10 | 10 | 7 | 5 | 6 | 5 | 6 | 5 | 6 | 6 | 8 | 7 | 2 | 191 | |
| | | 13 | 1 | 1 | 1 | 1 | 5 | 3 | 1 | 8 | 3 | 7 | 3 | 7 | 5 | 6 | 12 | 9 | 11 | 7 | 11 | 12 | 14 | 2 | 6 | 11 | 6 | 13 | 1 | 7 | 4 | 5 | 181 | | |
| | | 12 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 4 | 1 | 1 | 6 | 5 | 5 | 8 | 2 | 5 | 10 | 7 | 8 | 7 | 8 | 3 | 12 | 5 | 10 | 5 | 6 | 7 | 8 | 7 | 8 | 154 | |
| | | 11 | 1 | 1 | 1 | 1 | 2 | 1 | 4 | 4 | 7 | 2 | 9 | 1 | 5 | 8 | 6 | 4 | 9 | 6 | 6 | 5 | 4 | 7 | 5 | 6 | 5 | 6 | 7 | 3 | 6 | 5 | 135 | | |
| | | 10 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 5 | 2 | 3 | 2 | 3 | 4 | 3 | 3 | 4 | 3 | 11 | 6 | 5 | 4 | 7 | 5 | 8 | 2 | 6 | 5 | 6 | 8 | 10 | 121 | | |
| | | 9 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 3 | 1 | 3 | 5 | 1 | 3 | 2 | 4 | 6 | 6 | 4 | 6 | 3 | 5 | 3 | 10 | 4 | 3 | 2 | 2 | 8 | 90 | |
| | | 8 | 8 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 3 | 1 | 3 | 2 | 4 | 2 | 4 | 4 | 4 | 2 | 4 | 2 | 2 | 2 | 2 | 1 | 4 | 2 | 6 | 5 | 1 | 5 | 58 |
| | | 7 | 7 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 3 | 4 | 1 | 1 | 1 | 2 | 5 | 2 | 1 | 9 | 4 | 5 | 5 | 2 | 6 | 8 | 6 | 62 | |
| | | 6 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 6 | 1 | 1 | 2 | 6 | 31 | |
| | | 5 | 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 3 | 2 | 3 | 3 | 3 | 3 | 1 | 1 | 6 | 6 | 1 | 4 | 8 | 4 | 8 | 49 | |
| | | 4 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 4 | 1 | 4 | 24 | | |
| | | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 5 | 2 | 21 | | |
| | | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 4 | 13 | | | |
| | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 4 | | | |
| | | 0 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | 18 | | | | |
| Total | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | | | |
| N | | 204 | 124 | 155 | 162 | 179 | 165 | 178 | 157 | 161 | 155 | 170 | 164 | 151 | 126 | 148 | 150 | 121 | 128 | 157 | 121 | 126 | 104 | 106 | 73 | 107 | 92 | 101 | 87 | 85 | 82 | 125 | 4154 | | |

Figure 5.4 BMSLSS by SEDS-S Array Distribution Density for Females

Dual-Factor Model

| Male | | Social Emotional Distress Scale | | | | | | | | | | | | | | | N | | | | | | | | | | | | | | |
|-------|-----|---------------------------------|-----|-----|-----|-----|--------------------|-----|-----|-----|-----|------------------|-----|----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|----|
| | | Low (A) (50.2%) | | | | | Middle (B) (25.7%) | | | | | High (C) (24.1%) | | | | | | | | | | | | | | | | | | | |
| 25 | 97 | 19 | 21 | 17 | 11 | 5 | 8 | 7 | 3 | 1 | 3 | 1 | 2 | 1 | 2 | 1 | 3 | 6 | 3 | 1 | 0 | 1 | 2 | 1 | 0 | 0 | 1 | 0 | 17 | 239 | |
| 24 | 58 | 23 | 18 | 12 | 10 | 8 | 9 | 4 | 6 | 4 | 5 | 1 | 2 | 2 | 3 | 1 | 0 | 2 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 174 | |
| 23 | 68 | 20 | 19 | 13 | 15 | 9 | 8 | 15 | 12 | 3 | 6 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 1 | 0 | 0 | 235 | | |
| 22 | 56 | 24 | 17 | 23 | 16 | 22 | 13 | 13 | 7 | 4 | 3 | 3 | 4 | 8 | 3 | 4 | 5 | 2 | 3 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 261 | | |
| 21 | 56 | 35 | 34 | 19 | 32 | 26 | 20 | 17 | 14 | 21 | 7 | 17 | 7 | 3 | 6 | 6 | 4 | 2 | 12 | 2 | 3 | 1 | 0 | 0 | 1 | 1 | 2 | 1 | 351 | | |
| 20 | 90 | 39 | 51 | 40 | 32 | 30 | 22 | 22 | 23 | 24 | 24 | 14 | 14 | 9 | 8 | 6 | 7 | 6 | 5 | 6 | 11 | 4 | 3 | 2 | 3 | 2 | 0 | 2 | 501 | | |
| 19 | 36 | 27 | 41 | 17 | 26 | 22 | 18 | 15 | 15 | 11 | 17 | 15 | 9 | 6 | 8 | 5 | 6 | 6 | 3 | 4 | 4 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 322 | | |
| 18 | 23 | 22 | 12 | 23 | 25 | 16 | 15 | 22 | 12 | 19 | 11 | 8 | 9 | 6 | 7 | 4 | 3 | 5 | 5 | 1 | 3 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 264 | | |
| 17 | 16 | 13 | 12 | 12 | 17 | 12 | 17 | 9 | 13 | 6 | 11 | 9 | 13 | 9 | 11 | 6 | 4 | 3 | 8 | 5 | 6 | 5 | 4 | 2 | 2 | 3 | 1 | 2 | 231 | | |
| 16 | 11 | 5 | 5 | 11 | 10 | 8 | 13 | 11 | 16 | 8 | 13 | 8 | 7 | 6 | 6 | 4 | 4 | 7 | 5 | 5 | 2 | 3 | 4 | 3 | 1 | 1 | 1 | 1 | 196 | | |
| 15 | 10 | 4 | 12 | 5 | 7 | 9 | 9 | 10 | 9 | 11 | 16 | 3 | 6 | 6 | 16 | 8 | 5 | 5 | 4 | 5 | 3 | 3 | 2 | 3 | 5 | 2 | 2 | 2 | 193 | | |
| 14 | 4 | 3 | 1 | 7 | 6 | 11 | 6 | 3 | 7 | 8 | 5 | 8 | 6 | 6 | 9 | 7 | 5 | 5 | 6 | 7 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 2 | 152 | |
| 13 | 7 | 2 | 4 | 5 | 5 | 2 | 4 | 5 | 6 | 8 | 7 | 7 | 2 | 8 | 7 | 6 | 6 | 5 | 5 | 1 | 6 | 1 | 5 | 1 | 2 | 1 | 1 | 4 | 2 | 127 | |
| 12 | 2 | 2 | 1 | 2 | 4 | 4 | 6 | 8 | 10 | 7 | 6 | 5 | 6 | 7 | 6 | 7 | 2 | 4 | 7 | 4 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 2 | 114 | | |
| 11 | 2 | 2 | 1 | 4 | 3 | 3 | 1 | 5 | 6 | 3 | 4 | 3 | 1 | 1 | 5 | 4 | 4 | 8 | 1 | 4 | 3 | 1 | 1 | 4 | 3 | 3 | 2 | 2 | 84 | | |
| 10 | 5 | 2 | 4 | 3 | 3 | 1 | 2 | 1 | 1 | 7 | 3 | 6 | 3 | 6 | 5 | 4 | 3 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 4 | 1 | 1 | 85 | | |
| 9 | | | | | | | | 2 | 1 | 4 | 4 | 2 | 3 | 3 | 3 | 4 | 3 | 2 | 2 | 4 | 2 | 2 | 5 | 3 | 2 | 1 | 1 | 1 | 71 | | |
| 8 | 1 | | | | | | | | 3 | 3 | 1 | 6 | 1 | 1 | 1 | 1 | 4 | 3 | 5 | 1 | 1 | 4 | 1 | 1 | 1 | 3 | 1 | 2 | 2 | 53 | |
| 7 | 1 | 1 | | | | | | 1 | 1 | 3 | 1 | 1 | 5 | 2 | 5 | 4 | 2 | 2 | 3 | 2 | 3 | 1 | 2 | 2 | 1 | 1 | 1 | 3 | 2 | 54 | |
| 6 | 3 | | | | | | | | 2 | | | 1 | 1 | 1 | 1 | 3 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 1 | 1 | 26 | | |
| 5 | 3 | | | | | | | | 1 | | 3 | | 3 | 1 | 1 | 2 | 1 | 2 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 4 | 37 | |
| 4 | 3 | 1 | | | | | | | | | 2 | 1 | | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 22 | | |
| 3 | 3 | 1 | | | | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | 12 | | |
| 2 | | | | | | | | | | | 1 | 1 | | 1 | 1 | | 1 | | | | | | | | | | | | 10 | | |
| 1 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 5 | | |
| 0 | 11 | 2 | 1 | 2 | | | 2 | 2 | 1 | | | | 1 | 1 | 1 | 2 | | | | | | | | | | | | | 34 | | |
| Total | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| N | 568 | 256 | 264 | 222 | 234 | 204 | 186 | 166 | 177 | 168 | 154 | 123 | 108 | 93 | 123 | 98 | 79 | 81 | 84 | 65 | 72 | 48 | 37 | 32 | 34 | 34 | 26 | 27 | 23 | 17 | 50 |

Figure 5.5 BMSLSS by SEDS-S Array Distribution Density for Males

cumbersome or too restrictive to direct resources appropriately. This 25–25–50 approach to cut-scores is offered as a balanced way to consider and categorize all students within a 3×3 DFM.

Applying this perspective creates nine logical array zones; however, this is not a constrained categorization system. We do not use or suggest descriptive labels, although it is clear that array areas represent positive wellness (upper left) and deficient wellness (lower right). As a convention to facilitate review and discussion, encourage “zonal” DFM universal wellness monitoring thinking, and given DFM’s use primarily in educational contexts, we use low, middle, and high to label array zones. Additionally, consistent with “grades” that are often offered in schools, we use the “ABCs” to label array zones and to provide a mnemonic to facilitate conversation. For each factor, an *A-grade* or *high* represents a positive wellness indicator (top 50% BMSLSS and lowest 50% SEDS), and a *C-grade* or *low* represents an adverse wellness indicator (lowest 25% BMSLSS and highest 25% SEDS). Middle-range values designate a *B-grade* or *middle*. Figures 5.4 (females) and 5.5 (males) show the resulting DFM joint arrays with the associated ABC designation zone along with descriptors of high, middle, and low. Instead of relying on precise cut points, we recommend that scores on the two measures used to examine the DFM be plotted in a logical array. Graphing a student’s score in the distribution array provides information on possible areas or zones related to different symptoms and wellness profiles’ covariates, as opposed to an exact score.

Considering DFM as an array has potential advantages because it naturally and logically depicts a response space that retains complete information about students’ response patterns. As a result, the interpretation deemphasizes where the child falls on each DFM factor and emphasizes each student’s jointly defined response distribution zone. Amending the prototypic DFM structure (Greenspoon & Saklofske, 2001), we propose an array representation that merges with and complements universal school-based mental wellness monitoring aims. The next logical step is to propose wellness by distress response patterns representing meaningful joint distribution zones. Here, cut-scores are not intended, as usual, to make diagnostic or placement decisions; they are a heuristic to provide school personnel an added datum, which, when integrated with other information, inform care teams’ evaluation of students’ needs.

Reframing DFM as a Joint Distribution Array

Following an examination of the measures’ psychometrics and creating cut-scores for the 3×3 DFM, we examined the joint distribution of scores across the two DFM measures used in this example. Using the BMSLSS and SEDS-S for DFM screening assessment produces 806 (31×16 , note 0 is a valid score) unique, directly scrutinized response combinations. Because males and females had significantly different SEDS-S responses, we ascertained the wellness \times distress response distributions for females (Figure 5.4) and males (Figure 5.5) individually. Previous DFM research has inconsistently organized the x and y axes; hence, we propose and use the traditional 0,0 array coordinate origin as a convention for DFM 3×3 research and screening applications.

A core observation is that even with a large sample, the two DFM measures’ joint distribution had many response patterns with empty cells for females and males. The BMSLSS and SEDS-S had skewed distributions, with most joint responses falling in the array’s upper left quadrant. This array location reflects higher life satisfaction and lower distress, or balanced, positive mental health. Figures 5.4 and 5.5 show the number of students, out of 8,008 (4,154 females and 3,854 males, respectively) that have each unique joint DFM response. For example, the most upper-left cell of Figure 5.4 shows that 45 females had a BMSLSS maximum score of 25 and a SEDS-S score of zero.

Evaluate Dual-Factor Category Differences

After establishing the validity of the measures used and reframing the DFM as a joint distribution array, we sought to evaluate the differences among the various DFM categories based on their life satisfaction (obtained from the BMSLSS) and distress (obtained from the SEDS-S). Specifically, we examined how students in the nine logical array zones differed on critical quality of life indicators, including emotional and behavioral risks; school safety, victimization, and belonging; and psychological assets and social resources (see Tables 5.2–5.5). For ease of presentation, we describe levels of life satisfaction (from high to low A, B, and C) followed by distress levels (from high to low C, B, and A) with nine resulting combinations.

Emotional and Behavioral Risks

The high life satisfaction/low distress (AA) group had the lowest percentage of students reporting emotional risk, including past 12-month chronic sadness and suicidal thoughts. The low life satisfaction/high distress group (CC) had the highest percentage of students reporting emotional risk. Both distress and life satisfaction levels were significant predictors of emotional risk—a positive predictor and a negative predictor, respectively. Hence, the combination of lower life satisfaction and higher distress predicted less emotional risk in both female (see Table 5.2) and male (see Table 5.3) students.

Among female students (see Table 5.2), we identified dual-factor group differences in only one of the behavioral risk indicators (30-day marijuana use) but not in the other indicator (30-day alcohol use). Differences in 30-day marijuana use across distress groups did not seem significant, especially between mid and high distress groups. However, differences in 30-day marijuana use between life satisfaction groups were noticeable when combined with any distress group. For example, the percentage of students reporting marijuana use in the past 30 days was 5.2% for the high life satisfaction/low distress (AA) group, 12.5% for the middle life satisfaction/low distress (BA) group, and 22.2% for the low life satisfaction/low distress (CA) group (see Table 5.2). Among male students, there were no significant dual-factor group differences in behavioral risk (see Table 5.3).

School Safety, Victimization, and Belonging

Among both male and female students, dual-factor group differences were found in feeling safe at school and reporting victimization experience (see Table 5.2 for females and Table 5.3 for males). Students with higher life satisfaction and lower distress were more likely to report higher school safety and less likely to report victimization. Although both life satisfaction and distress were significant predictors, life satisfaction was a stronger predictor of school safety than distress level. Specifically, regardless of distress levels, students with high life satisfaction (A) were more likely to report higher school safety than students with middle (B) and low (C) life satisfaction. Those with middle life satisfaction (B) were more likely to report higher school safety than those with low life satisfaction (C). For example, students in the high life satisfaction and high distress (AC) group still reported higher school safety levels than those in the middle life satisfaction and low distress (BA) group, suggesting the significant role of life satisfaction in feeling safe at school.

Among both female (see Table 5.2) and male (see Table 5.3) students, dual-factor group differences were reported in both school belonging indicators—feeling part of the school and enjoying work with classmates. Distress level was not a significant predictor of school belonging, having no clear positive or negative relationship. Conversely, life satisfaction level was a significant predictor of both school belonging indicators. Regardless of distress level, students with high life satisfaction

Table 5.4 Female Mean Item Response Values for Personal Assets by Dual-Factor Model 3 × 3 Group Classification Groups

| Brief Multidimensional Student Life Satisfaction Scale | | | | | | | | | | | |
|--|---------------------|---------------------|-------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|-----------|
| (A) High | | | (B) Middle | | | (C) Low | | | SEDS-S distress | | |
| (A) Low | (B) Mid | (C) High | (A) Low | (B) Mid | (C) High | (A) Low | (B) Mid | (C) High | (A) Low | (B) Mid | (C) High |
| (AA) | (AB) | (AC) | (BA) | (BB) | (BC) | (CA) | (CB) | (CC) | F | | |
| <i>Resource and Asset Indicators</i> | | | | | | | | | | | |
| SEHS-S Belief in Self (0–3) | M 2.05 _a | 1.83 _b | 1.96 _a | 1.61 _c | 1.58 _{c,d} | 1.47 _{d,e} | 1.36 _{e,f} | 1.29 _f | 1.13 _g | 1.13 _g | 231.68*** |
| | SD (0.48) | (0.49) | (0.59) | (0.49) | (0.50) | (0.55) | (0.62) | (0.48) | (0.54) | (0.54) | |
| SEHS-S Belief in Others (0–3) | M 2.43 _a | 2.32 _a | 2.37 _a | 1.88 _b | 1.96 _b | 1.98 _b | 1.46 _c | 1.53 _c | 1.45 _c | 1.45 _c | 306.28*** |
| | SD (0.44) | (0.44) | (0.48) | (0.53) | (0.48) | (0.53) | (0.64) | (0.56) | (0.60) | (0.60) | |
| SEHS-S Emotional Competence (0–3) | M 2.20 _a | 2.08 _{b,c} | 2.27 _a | 1.92 _{d,e} | 2.03 _{c,d} | 2.16 _{a,b} | 1.77 _e | 1.87 _{d,e} | 2.00 _{c,d} | 2.00 _{c,d} | 42.33*** |
| | SD (0.51) | (0.50) | (0.45) | (0.51) | (0.47) | (0.45) | (0.62) | (0.51) | (0.52) | (0.52) | |
| SEHS-S Engaged Living (0–3) | M 2.10 _a | 1.80 _b | 1.88 _b | 1.55 _c | 1.51 _c | 1.33 _d | 1.23 _{d,e} | 1.14 _e | 0.91 _f | 0.91 _f | 331.93*** |
| | SD (0.53) | (0.52) | (0.63) | (0.51) | (0.49) | (0.56) | (0.63) | (0.54) | (0.56) | (0.56) | |
| School Connectedness (0–4) | M 2.84 _a | 2.72 _a | 2.73 _a | 2.38 _b | 2.36 _b | 2.33 _b | 1.93 _{c,d} | 2.00 _c | 1.82 _d | 1.82 _d | 157.48*** |
| | SD (0.66) | (0.65) | (0.75) | (0.61) | (0.66) | (0.75) | (0.80) | (0.72) | (0.79) | (0.79) | |
| MHC-SF Social Well-being (0–5) | M 3.51 _a | 2.94 _b | 2.98 _b | 2.29 _c | 2.09 _d | 2.00 _d | 1.55 _e | 1.56 _e | 1.10 _e | 1.10 _e | 208.47*** |
| | SD 1.26 | 1.27 | 1.42 | 1.26 | 1.12 | 1.24 | 1.30 | 1.12 | 1.01 | 1.01 | |

Note: The AA group reporting high life satisfaction and low emotional distress corresponds with the “complete mental health” label used in previous dual-factor model studies. SEDS-S = Social Emotional Distress Scale (Low = bottom 50.9%, Mid = middle 25.9%, High = top 23.2%, and most distress). BMSLSS = Brief Multidimensional Student Life Satisfaction Scale (Using the combined male and female sample: A = highest 50.2% to [approximately 50%–100%] of combined sample, B = middle 24.3% [approximately 26%–49%], and C = lowest 25.5% [approximately 1%–25%]). SEHS-S = Social Emotional Health Survey–Secondary. MHC-SF = Mental Health Continuum–Short Form. Significant pairwise comparisons (Turkey’s) shown by different letter subscripts for each measure. *** $p < 0.001$.

Dual-Factor Model

Table 5.5 Male Mean Item Response Values for Personal Assets by Dual-Factor Model 3 × 3 Group Classification Groups

| | | Brief Multidimensional Student Life Satisfaction Scale | | | | | | | | |
|-----------------------------------|----|--|-------------------|---------------------|---------------------|---------------------|-------------------|---------------------|---------------------|-----------|
| | | (B) Middle | | | (C) Low | | | SEDS-S distress | | |
| | | (B) Mid | (C) High | (A) Low | (B) Mid | (C) High | (A) Low | (B) Mid | (C) High | F |
| Dual-Factor Model 3 × 3 Group ID | | (AB) | (AC) | (BA) | (BB) | (BC) | (CA) | (CB) | (CC) | |
| Resource and Asset Indicators | | | | | | | | | | |
| SEHS-S Belief in Self (0–3) | M | 2.11 ^a | 2.00 ^a | 1.74 ^b | 1.63 ^b | 1.67 ^b | 1.40 ^c | 1.42 ^c | 1.32 ^c | 158.60*** |
| | SD | (0.52) | (0.47) | (0.49) | (0.47) | (0.51) | (0.69) | (0.56) | (0.60) | |
| SEHS-S Belief in Others (0–3) | M | 2.26 ^a | 2.21 ^a | 1.71 ^c | 1.80 ^{b,c} | 1.93 ^b | 1.32 ^e | 1.48 ^d | 1.47 ^{d,e} | 190.23*** |
| | SD | (0.53) | (0.50) | (0.53) | (0.52) | (0.54) | (0.70) | (0.59) | (0.60) | |
| SEHS-S Emotional Competence (0–3) | M | 2.08 ^{a,b} | 2.06 ^b | 1.80 ^{d,e} | 1.84 ^c | 2.01 ^{b,c} | 1.54 ^f | 1.73 ^e | 1.89 ^{e,d} | 46.09*** |
| | SD | (0.53) | (0.48) | (0.54) | (0.51) | (0.50) | (0.71) | (0.56) | (0.54) | |
| SEHS-S Engaged Living (0–3) | M | 2.56 ^a | 1.89 ^b | 1.58 ^c | 1.43 ^d | 1.42 ^d | 1.20 ^e | 1.17 ^{e,f} | 1.02 ^f | 243.67*** |
| | SD | (0.57) | (0.53) | (0.55) | (0.57) | (0.59) | (0.70) | (0.59) | (0.63) | |
| School Connectedness (0–4) | M | 2.90 ^a | 2.81 ^a | 2.32 ^b | 2.43 ^b | 2.38 ^b | 2.02 ^c | 2.10 ^c | 1.94 ^c | 115.01*** |
| | SD | (0.68) | (0.67) | (0.67) | (0.67) | (0.76) | (0.88) | (0.76) | (0.87) | |
| MHC-SF Social Well-being (0–5) | M | 3.59 ^a | 3.19 ^b | 2.37 ^c | 2.18 ^c | 2.05 ^c | 1.74 ^d | 1.52 ^{d,e} | 1.37 ^e | 200.06*** |
| | SD | 1.31 | 1.30 | 1.34 | 1.23 | 1.27 | 1.54 | 1.25 | 1.24 | |

Note: The AA group reporting high life satisfaction and low emotional distress corresponds with the “complete mental health” label used in previous dual-factor model studies. BMSLSS = Brief Multidimensional Student Life Satisfaction Scale (Using the combined male and female sample: A = highest 50.2% to [approximately 50%–100%] of combined sample, B = middle 24.3% [approximately 26%–49%], and C = lowest 25.5% [approximately 1%–25%]). Social Emotional Distress Scale for the male sample: (Low = bottom 50.9%, Mid = middle 25.9%, High = top 23.2%, most distress). SEHS-S = Social Emotional Health Survey–Secondary. MHC-SF = Mental Health Continuum–Short Form. Significant pairwise comparisons (Turkey’s) shown by different letter subscripts for each measure. *** $p < 0.001$.

(A) showed higher levels of school belonging than students with middle (B) and low (C) levels of life satisfaction, and students with middle (B) levels of life satisfaction showed higher levels of school belonging than students with low (C) levels of life satisfaction groups. For example, students with high life satisfaction and high distress (AC) still reported higher school belonging levels than those with middle life satisfaction and low distress (BA), suggesting the importance of life satisfaction in feeling of belonging to the school.

Psychological Assets and Social Resources

Among both male and female students, there were dual-factor group differences in all psychological assets and social resources indicators, including Belief in Self, Belief in Others, Emotional Competence, Engaged Living, School Connectedness, and MHC-SF Social Well-being (see Table 5.4 for females and Table 5.5 for males). Distress level was not a significant predictor of psychological assets and social resources, having no clear positive or negative relationship with psychological assets and social resources. Conversely, life satisfaction was found to be a significant predictor of all indicators. Regardless of distress level, students with high (A) life satisfaction reported higher levels of psychological assets and social resources than student with middle (B) and low (C) levels of life satisfaction, and middle life satisfaction (B) groups showed higher levels of psychological assets and social resources than low life satisfaction (C) groups. For example, students with high life satisfaction and high distress (AC) still reported higher levels of psychological assets and social resources than those with middle life satisfaction and low distress (BA), once again suggesting the significant role of life satisfaction in reporting psychological assets and resources.

Summary of the 3 × 3 DFM Validation Analyses

Is this proposed 3 × 3 DFM approach the only way to address and measure DFM? Certainly not. A DFM application should include general well-being or life satisfaction measures; however, the distress or symptomatology assessments could vary depending on the interests of a school's care team. We used a general distress measure that focused on sad or worried emotions during the past month. Such assessments are generally useful in numerous educational contexts and represent the students' most common emotional distress experiences. Other DFM approaches could focus on other concerns, such as behavioral problems. A caveat is that the measures need to be validated for a wellness screening and have a known joint distribution, as was demonstrated in this chapter. One other requirement is a standardized interpretation protocol that produces the same arrangement across the two DFM factors, regardless of who administers and scores responses and the sample employed. One final observation is that although the DFM conceptual frame has been applied in a non-Western cultural context (e.g., Xiong *et al.*, 2017), the 3 × 3 approach might not provide an optimal fit in all contexts. For example, DFM might include constructs such as Psychological Suzhi applicable to Chinese cultural contexts (Qian *et al.*, 2020; Wang & Zhang, 2012).

Applying the 3 × 3 Model: Implications for Universal School Wellness Screening

Using the joint distribution array, combined with the cut-scores created and described above, practitioners may efficiently plot students' complete mental health functioning, inclusive of positive and negative indicators of mental health. Consistent with previously recommended dual-factor approaches, this proposed approach's initial steps involve administering measures that assess distress and wellness. If a practitioner uses both the BMSLSS and the SEDS-S, students' scores can be plotted on the separate joint distribution arrays for females (see Figure 5.4) and males (see Figure 5.5). Scores on the BMSLSS range from 0 to 25 and can be plotted on the y axis. Using the

cut-scores as denoted by the bold vertical lines and determined based on the large, diverse sample described above, a practitioner can determine if the student's life satisfaction is in the low (C), middle (B), or high (A) range. Scores on the SEDS-S range from 0 to 30 and can be plotted on the x axis. Similarly, using the cut-scores for the SEDS-S as denoted by the bold horizontal lines in the graph, a practitioner can readily see if the student's level of distress is in the low (A), middle (B), or high (C) range. Using the combination of both scores will lead to an x, y coordinate within the graph. Considering the 3×3 nature of this graph, a student will then be placed into one of the nine DFM categories to describe their complete mental health functioning, inclusive of distress and life satisfaction. A female student (use Figure 5.4) who obtains a score of 13 on the BMSLSS and a score of 15 on the SEDS would be plotted precisely in the middle of the graph (BB). Visual examination of the array distributions compared to the plotted x, y coordinate for each student provides useful information about how common that student's score profile is. More importantly, the plotted x, y coordinate provides information describing the student's functioning, which can be useful for prevention and intervention planning. Figures 5.6 (for females) and 5.7 (for males) are provided as blank joint distribution arrays that can be used to plot the x, y coordinates for students. Although additional research is needed to determine if the distribution of scores will remain across other samples, these arrays based on a large sample are provided to assist practitioners and researchers seeking a simplified approach to DFM assessment.

This proposed approach to implementing DFM has the advantage of being efficient and brief—it also supports school mental health screening multiple times per year. We also recognize that this approach requires the need to plot each student's score before interpretation. Additional technology would help automatize further the process of plotting multiple students' scores simultaneously; this will be especially needed when all students complete measures within a universal screening context. The use of an emotional distress measure that asks about students' past-month experiences has the added advantage of allowing practitioners and others to assess student changes across one academic year and beyond. A student's x, y coordinate score and resulting category could be easily graphed across multiple administrations to monitor progress or set intervention targets. Future research is needed to establish practical suggestions and resources for students within each of the nine categories. Additionally, as this is a proposed approach for screening instead of comprehensive assessment, practitioners are encouraged to combine this DFM information with other information available to them (i.e., attendance, grades, and teacher reports) to determine the best path forward. For example, additional assessment with more comprehensive tools may be necessary for students, particularly in the lowest balanced wellness zones (i.e., low life satisfaction, high distress CC category), to determine how to best support these students. However, with a uniform approach to DFM assessment, researchers and practitioners can begin to make progress in determining how to best support students within each of these nine DFM zones.

Connecting the 2×2 and 3×3 DFMs

Unsurprisingly, there was substantial overlap between the 2×2 and 3×3 DFM approaches. In the 2×2 DFM construction, the two most intriguing groups are Suldo and Shaffer's (2008) *languishing* and the *symptomatic but content* groups because traditional school-based mental health screening already identifies *troubled* students. For this chapter's 3×3 categories, 47% of the students were in the highest balanced wellness (AA; high life satisfaction and low distress) and lowest balanced wellness (CC; low life satisfaction and high distress) zones. In the 2×2 model, these students would have been placed in the *complete mental health* (i.e., highest balanced wellness) or *troubled* (i.e., lowest balanced wellness) zones. In this chapter's analyses, these two groups had large effect size differences on nearly all covariates—these students' needs and support are reasonably well understood. This

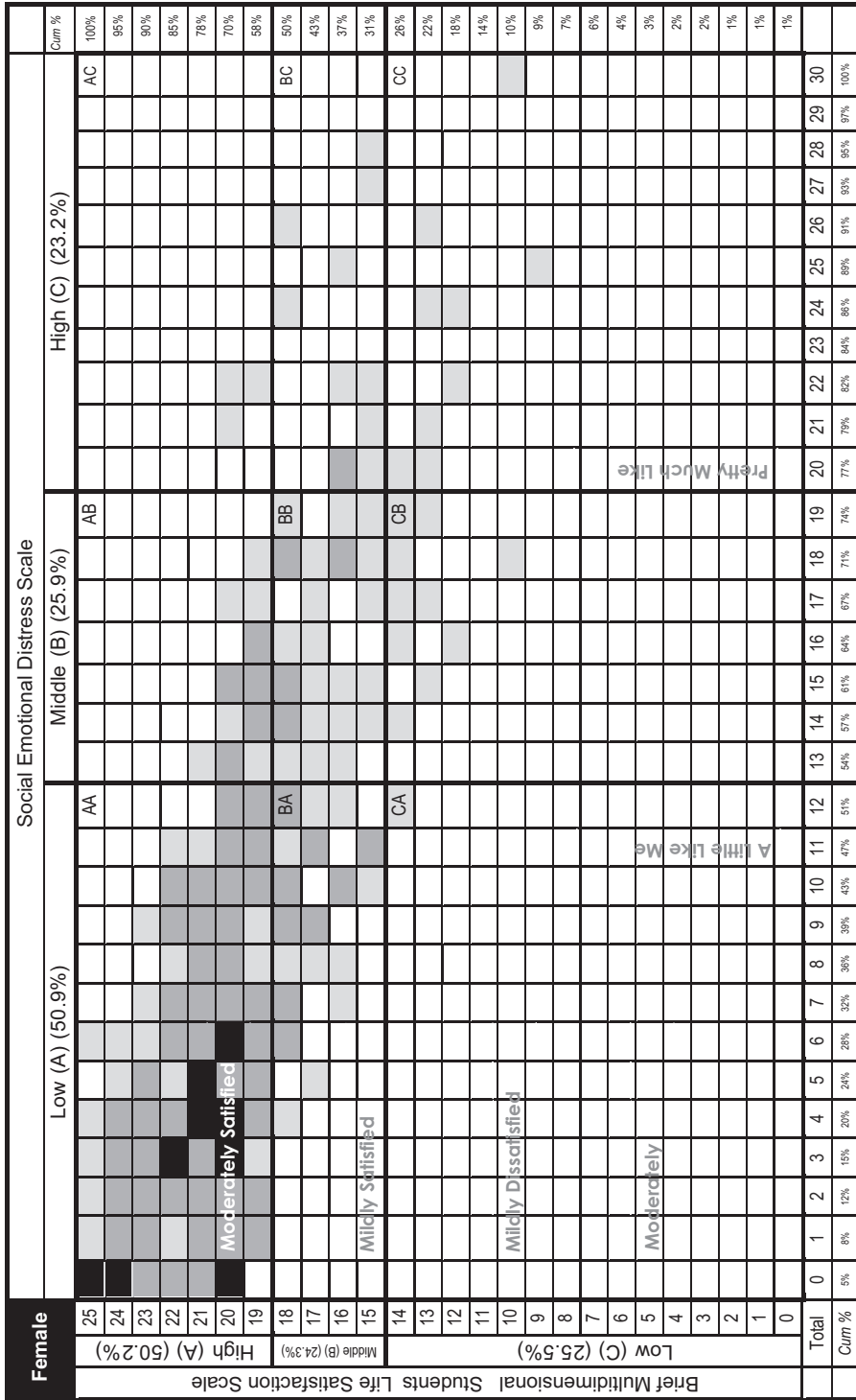


Figure 5.6 BMSLSS by SEDS-S Distribution Density for Females Monitoring Array

Dual-Factor Model

| Male | | Social Emotional Distress Scale | | | | | | | | | | Cum % | | | | | | | | | | | | | | | | | | |
|-------|------------------|---------------------------------|-----|-----|--------------------|-----|-----|------------------|-----|-----|-----|-------|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| | | Low (A) (50.2%) | | | Middle (B) (25.7%) | | | High (C) (24.1%) | | | | | | | | | | | | | | | | | | | | | | |
| 25 | High (A) (50.2%) | | | | | | | | | | | | | | | | | | AC | 100% | | | | | | | | | | |
| 24 | | | | | | | | | | | | | | | | | | | | 95% | | | | | | | | | | |
| 23 | | | | | | | | | | | | | | | | | | | | 91% | | | | | | | | | | |
| 22 | | | | | | | | | | | | | | | | | | | | 85% | | | | | | | | | | |
| 21 | | | | | | | | | | | | | | | | | | | | 78% | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | | | | | | 70% | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | | | | | | | 58% | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | | | | | | | 50% | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | | | | | | | 43% | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | | | | | | 36% | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | | | | 31% | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | | | | 26% | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | | | | | | 21% | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | 17% | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | 14% | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | 11% | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | 9% | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | 7% | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | 5% | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | 4% | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | 3% | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | | | 2% | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | 1% | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | | <1% | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | | | | <1% | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | <1% | | | | | | | | | | |
| Total | | 15% | 21% | 28% | 34% | 40% | 45% | 50% | 55% | 59% | 64% | 68% | 71% | 73% | 76% | 79% | 82% | 84% | 86% | 88% | 90% | 92% | 93% | 94% | 95% | 96% | 97% | 98% | 99% | 100% |

Figure 5.7 BMSLSS by SEDS-S Distribution Density for Males Monitoring Array

finding further validates the 2×2 DFM approach, particularly when used for school-wide student wellness screening.

Moreover, when used for universal monitoring, a school's coordinated care service response explores ways to nurture, foster, and support students' continued positive development. Students in the low life satisfaction coupled with high distress (CC) zone would benefit from follow-up, tier 2 assessment, and support services. Conversely, students in the high life satisfaction and low distress (AA) zone report thriving mental health and will likely benefit from tier 1 services and will not need additional individualized services.

The finding that students in the highest (AA) and lowest (CC) balanced wellness zones differed in the current analyses is not especially informative. A traditional symptom universal screener sets cut-scores at 15%–25% of cases and targets those youth for follow-up check-ins. One DFM proof of concept test examines how the *symptomatic but content* zones (AC and BC) compare with the *troubled zone* (CC). If they are not different, it would indicate that accounting for life satisfaction does not add useful information beyond that gleaned from emotional distress alone. Likewise, the *symptomatic but content* (AC and BC) versus *languishing* (CA) zones comparison helps evaluate the relative impacts of low life satisfaction. Indeed, in this instance, life satisfaction was essential in differentiating mental health zones—students in zones with higher levels of life satisfaction, regardless of distress level, tended to report greater feelings of safety and belonging at school as well as more psychological assets and resources. *Symptomatic but content* zones (AC and BC) reported more assets and fewer emotional risks than the *troubled zone* (CC).

Higher life satisfaction was beneficial for the *symptomatic but content* (AC and BC) zones, as students in these zones were more likely to report positive outcomes despite having mid or high distress compared to those in the *languishing* zone (CA). This critical role of life satisfaction on positive student outcomes is also well-presented in the results for the *languishing* (CA) zone. The *languishing* zone (CA) consistently differed from *complete mental health* (AA and BA) and *symptomatic but content* (AC and BC) zones on positive outcomes, including school safety and belonging and psychological assets and resources. Specifically, students in the *languishing* (CA) zone consistently reported more frequent positive outcomes compared to *complete mental health* (AA and BA) and *symptomatic but content* (AC and BC) zones. The absence of distress was not sufficient in supporting similarly positive outcomes for the *languishing* zone compared to *complete mental health* zones (AA and BA).

What is gained from a 3×3 model is additional information on the students caught in the middle zones (i.e., middle wellness and middle distress)? In this example, students in these zones significantly differed from youth in the higher and lower balanced wellness zones across several outcomes, including feelings of safety, connection, and belonging at school, psychological assets, and social well-being. This variation tended to be more pronounced for youth in the middle (B) life satisfaction zone, regardless of distress level, when compared to youth in the high (A) or low (C) life satisfaction zones. Youth in middle life satisfaction and distress zones generally enjoyed a happier, healthier quality of life than youth with lower levels of life satisfaction and more distress, but not as well as youth with the highest levels of life satisfaction and lowest levels of distress. These findings underscore the benefits of DFM examining how students in the middle distress and well-being zones fair in their psychosocial development. Even though students in these middle zones may not be a target for immediate follow-up, school care providers must understand that these students may be experiencing nonoptimal life experiences and are at risk for more negative experiences. Overall, there is potential value in looking at students in the middle DFM zones when the penultimate goal is to help as many students as possible thrive and reach higher wellness levels, autonomy, and competence and make meaningful community contributions.

The analyses suggested an intriguing new perspective on students scoring in the zones corresponding to high or middle life satisfaction and high distress (AC and BC). Students in these zones

generally resembled Suldo and Shaffer's (2008) *symptomatic but content* group. Researchers have previously suggested that the symptomatic but content group could be behaviorally maladjusted (e.g., Greenspoon's & Saklofske, 2001; Analysis B, Figure 5.2). The information reviewed in this chapter, however, suggests another hypothesis. The students in these zones (high or middle life satisfaction and high distress; AC and BC) reported several traditional mental health concerns; for example, they reported high levels of sadness and suicidal ideation (Tables 5.2 and 5.3). However, they also reported having more social resources and personal assets (Tables 5.4 and 5.5). Rather than presenting as a confounding or counterintuitive classification, youth in these DFM zones might be better understood and further considered through a resilience, theoretical competence lens (see Lenzi et al., 2015).

Grych et al. (2020) examined a resilience hypothesis in a survey study of 466 adolescents residing in the Appalachia region of the United States. This study's primary goal was to investigate which factors might play a protective, resilience-boosting influence on youth. Diener's well-being measure and a trauma checklist created the prototypic DFM groups. Instead, it assessed if protective resilience factors (e.g., internal = self-control, emotional regulation, and external = parental and peer support) were associated differentially with DFM groups. Consistent with typical DFM research, a complete mental health group differed from a troubled group on all life quality indicators. Of interest, the symptomatic but content and languishing groups had different strength patterns. Compared to each other, the symptomatic but content group reported more positive social supports, emotional awareness, and a sense of purpose. The languishing group reported relative resilience strengths of emotional regulation and optimism. Hence, both the languishing and symptomatic but content youths reported resilience-promoting characteristics that might help understand how they have not declined into the troubled group. Both groups have access to interpersonal and intrapersonal resilience promoters.

More information is needed to explore the role that resilience plays and students' zonal placements in the DFM array. But to do this, DFM research must adopt a standard method to form the groups; otherwise, it is futile to compare across studies when the DFM measures and cut-points are essentially unique to each study. This chapter provided one possibility for a uniformed 3×3 DFM approach that could be adopted to further scientific research and applied practice within schools.

Discussion and Contributions

We proposed a DFM protocol using co-normed measures across a large, diverse sample, simultaneously linked with other quality of life indicators and measures. The current chapter offered these contributions to the broader DFM research line:

- 1 This chapter proposed and validated a 3×3 DFM approach that is easily adaptable for individual practitioners and scalable to the school, district, and regional levels.
- 2 A large-sample, wellness-distress joint distribution was presented for the first time.
- 3 The modified DFM approach de-emphasized traditional cut-scores and labels, emphasizing DFM joint response zones.
- 4 Practitioners can integrate this information with other known information accessible by school personnel and care coordination teams.

The following sections discuss essential considerations for the chapter's information and subsequent use of the 3×3 DFM for research and universal school wellness monitoring.

Importance of Life Satisfaction

Life satisfaction was strongly related to a range of quality of life indicators, more so than emotional distress. The finding is consistent with previous research on life satisfaction's positive associations with various quality of life indicators (self-esteem, hope, gratitude, and positive social relationships) and negative associations with adverse development indicators (anxiety, depression, and social stress; Gilman & Huebner, 2006, Proctor et al., 2009a). In the current study, youth fared more favorably when reporting higher life satisfaction, even when distress was present. This compelling finding showed that students with higher life satisfaction levels reported substantially higher quality of life indicators than students with similar distress. Moreover, even more dramatically, students with high life satisfaction in the presence of high distress had healthier quality of life indicators than students with middle life satisfaction combined with low distress.

The overwhelming majority of all comparisons across the nine DFM groups favored those students in the highest life satisfaction range. This finding is consistent with research revealing the overall benefits of facilitating students' realistic and grounded life satisfaction mindsets (Gilman & Huebner, 2006; Proctor et al., 2009b). Students reporting the highest level of life satisfaction had more favorable status on positive and adverse wellness indicators, regardless of their reported level of recent emotional distress. It was more indispensable to know the students' overall life satisfaction level in evaluating students' overall well-being than ascertaining their recent emotional distress experience.

Students reporting higher life satisfaction levels may be in virtuous developmental cycles that lead to upwardly improving life circumstances (Zhou et al., 2020). This pattern is consistent with Fredrickson's *broaden and build* theory (Stiglbauer et al., 2013). It is not just that students experience positive emotions. These positive experiences could facilitate the growth of a global mindset that a student's "life is going well." These students experience more favorable longer-term developmental outcomes. Suldo and Huebner (2004) found that students with positive life satisfaction were less likely to develop later externalizing behaviors in the presence of stressful life events. Life satisfaction, thus, is not a simple by-product of positive life experiences, but it actively promotes resilience and wellness among youth as a fundamental psychological construct (Huebner et al., 2006).

This current sample's life satisfaction levels revealed a positively skewed distribution; however, this alone is not a cause for celebration for educators. Even for the highest life satisfaction groups (AA, AB, and AC), regardless of the level of distress, only two of three or three out of four students reported feeling they felt they were part of the school. About one of two students in middle life satisfaction groups reported that they felt part of the school (BA, BB, and BC). Furthermore, for the lowest life satisfaction group of students (CA, CB, and CC), only one out of four to one out of three felt they were a part of their school. This observation highlights the value of employing a universal DFM mental health screening and monitoring approach. It has an expansive focus, including efforts to improve the whole school context. It links efforts to improve the school climate in ways that impact and benefit all students, emphasizing building their well-being.

Limitations and Cautions

The current chapter's sample included students from randomly selected schools, which is a strength of the methodology used. However, a possible selection bias was that the schools volunteered to participate in the study; hence the students were from schools with positive valence toward monitoring students' well-being. The survey procedures employed in this chapter were well developed and used in California for more than 25 years. Nonetheless, many students did not respond to a gender identity item, excluding them from the DFM analyses. This limitation diminished the sample size and introduced indiscernible bias into the study. We investigated which students did not respond to the gender items and examined their social-emotional distress item means. We

found that the mean scores fell between the means of students identifying as male or female. So, we suspect that this was a random, not systematic, bias. Future research must also employ nonbinary gender identification items. Of course, this needs to be evaluated in future research and can be further assessed by researchers who agree to combine dataset samples that employ the BMSLSS and SEDS-S in future research. In any case, the current sample provides a DFM origin or baseline sample. Researchers can use its means, standard deviations, and joint distribution to evaluate possible sample bias or sample differences in their future studies.

It is crucial in our view that school-wide universal screening has contextual and practical validity. All DFM indicators should provide information relevant to considering and understanding all students' mental health. Hence the approach proposed here was not to single out just the lowest or highest students in terms of the distribution of mental health and well-being but to understand better where all students fall within the distress by life satisfaction zone. Recognizing the life satisfaction and distress skewed distribution found in this study, DFM zones can readily fluctuate as the numerous students at the zonal boundaries experience multiple life and developmental challenges as they traverse the critical adolescent years.

Conclusion

In closing, we emphasize that the DFM approach presented in this chapter is just one circumscribed source of information about students' balanced mental health. A full assessment of youth well-being is more intricate (e.g., physical, social, spiritual, and cultural) than can be included in a universal DFM monitoring procedure. Hence, the 3×3 modified DFM is not appropriate for a high-stakes assessment context. DFM information should not be used to make definitive diagnostic or programmatic decisions about any particular student. Responsible use of universal DFM procedures incorporates it with other measures and indicators known to the school staff, community counselors, and others; information that is otherwise unobtainable via school-wide universal screening surveys. We look forward to continued progress in the field of DFM research to ultimately help students thrive both within the school context and throughout their lives.

Notes

- 1 The research reported in this chapter was supported in part by the Institute of Education Sciences, U.S. Department of Education, through Grant # R305A160157 to the University of California, Santa Barbara. The opinions expressed are those of the authors and do not represent views of the Institute of Education Sciences or the U.S. Department of Education.
- 2 Furlong, M. J., Dowdy, E., Moore, S., & Kim, E. (2022). Adapting the dual-factor model for universal school-based mental health screening: Bridging the research to practice divide. In K. A. Allen, M. J. Furlong, S. Suldo, & D. Vella-Brodrick (Eds.), *Handbook of positive psychology in schools: Supporting process and practice* (3rd ed.). Routledge, Taylor and Francis.
- 3 The cut-scores divided the responses into the low, middle, and high groups as close as possible into the 25–25–50 groups. Figures 5.6 and 5.7 show the cumulative percent of students for each SEDS-S and BMSLSS value.

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