

## Chapter 11: Measuring Well-Being in the Scholarship of Teaching and Learning

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Students' achievement and learning do not simply reflect their latent abilities or their conscientiousness. As instructors, we want to know the X-factor that could enhance students' learning experience, as well as the negative factors that could hinder it. We propose that students' psychological well-being—including positive aspects like having a global sense that one's life is good and negative aspects like crippling stress and anxiety—is an important factor in understanding students' experience in the classroom, including their learning, growth, motivation, and ultimate grade. For example, subjective well-being—one's global life satisfaction, frequency of positive emotions, and infrequency of negative emotions (Diener, Suh, Lucas, & Smith, 1999)—is predictive of success in multiple life domains, including relationships, health, and work (Lyubomirsky, King, & Diener, 2005). This chapter will provide instructors with an overview of scales to assess different aspects of well-being and illustrate how instructors can incorporate these measures in their scholarship of teaching and learning (SoTL).

### Positive Aspects of Well-Being

Some researchers subset positive aspects of well-being into hedonic and eudaimonic components, with the former being the “subjective well-being” construct described earlier (e.g., life satisfaction, positive and negative emotions) or just plain old “happiness,” and the latter being the degree to which one has a sense of meaning or purpose in life (e.g., Ryff, 1989). In practicality, hedonic and eudaimonic well-being are highly overlapping (Kashdan, Biswas-Diener, & King, 2008), but scales exist to measure the conceptually distinct constructs and we include a variety of options here. Notably, although various aspects of well-being have been linked with academically related outcomes among college students (see below), research on well-being and student performance, engagement, motivation, and learning is not as prevalent as might be expected, and could be a ripe area for future research.

### Life Satisfaction

The Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985), the most widely used life satisfaction measure, assesses respondents' current satisfaction and has been linked with academic achievement among college students (Borrello, 2005; Lepp, Barkley, & Karpinsky, 2014). The SWLS consists of five questions (e.g., “In most ways my life is close to my ideal,” “I am satisfied with my life”), which are rated on 7-point Likert-type scales (1 = *strongly disagree*, 7 = *strongly agree*). Validation studies have shown that the SWLS comprises a single factor and possesses high internal reliability (Cronbach's  $\alpha = .87$ ) and high test-retest reliability ( $r = .82$ ; Diener et al., 1985). Recent evidence suggests that just using one item, “In general, how satisfied are you with your life?” had similar patterns with other related variables as using

the rest of the scale, and it alone might be sufficient to capture a quick picture of life satisfaction (4-item scale from 1 = *very satisfied* to 4 = *very dissatisfied*, reverse-scored; Cheung, & Lucas, 2014; also see Hussey & Lehan's (2015) chapter of this e-book for additional information on scale validation).

One of the simplest ways for instructors to incorporate well-being scales into classroom research is to administer trait versions at the beginning of a course and then use them to predict course grades or other outcomes throughout the course (e.g., paper grades, attendance). In one such study, researchers administered the SWLS on the first day of an introductory psychology course and found that life satisfaction was positively related to students' final grades (Borrello, 2005). Surprisingly little research has taken this approach, so SoTL researchers could contribute greatly to the literature on well-being and academic achievement. In addition, exposing students to actual scales could be a valuable learning tool as they can see first-hand what it means when a research article says that participants reported their life satisfaction.

### Positive and Negative Emotions

In addition to knowing how students feel about their lives in general, instructors might also want to know how positively or negatively students have felt over the past week, past few days, today, or even "right now." Indeed, in accordance with the broaden-and-build theory (Fredrickson, 2001), positive emotions at one time point predicted school-related personal resources (i.e., a composite of academic self-efficacy, and study-related hope and optimism) at a subsequent time point among university students (Ouweneel, Le Blanc, & Schaufeli, 2011). To assess positive and negative emotions, we recommend the Affect-Adjective Scale (AAS; Diener & Emmons, 1984; Cronbach's  $\alpha = .89$  and  $.84$ , respectively), the Modified Differential Emotions Scale (mDES; Fredrickson, Tugade, Waugh, & Larkin, 2003;  $\alpha = .79$  and  $\alpha = .69$ , respectively), or the Positive and Negative Affect Schedule; (PANAS; Watson, Clark, & Tellegen, 1988,  $\alpha > .84$ ). The question stems of any of the three scales can all be altered to assess the time in the course of interest (e.g., "right now" vs. "past week"). Each scale assesses people's experience of positive and negative emotions over a specified time period, but each has unique attributes that might make it better or worse for your purposes.

For example, the AAS and PANAS are largely composed of high-arousal emotions (e.g., happy, joyful, distressed, irritable), whereas the mDES includes both low and high arousal emotions (e.g., interested, alert, curious). Both the AAS and the PANAS assess the extent to which people have felt a certain way (*not at all to very much or extremely*), whereas the mDES asks the frequency with which people have felt a certain way (*never, hardly, some of the time, often, and most of the time*). The former may assess intensity of emotions rather than frequency of occurrence, whereas the latter may miss the intensity of the emotion, but capture frequency. Both the AAS and the PANAS assess one emotion at a time, whereas a limitation of the mDES is that it lists three similar emotions at once (e.g., amused, fun-loving, and silly appear together), thus introducing confusion through triple-barreled questions (e.g., Gehlbach, 2015). The number of items for each measure differ widely, with the AAS including 9 items, the mDES 23

items, and the PANAS 44 items, and the measures also differ on number of scale anchors, with the PANAS and the mDES both using 5-point scales and the Affect-Adjective using a 7-point scale.

Instructors could take the pulse of the class by asking students how they feel “right now” before an important class activity or exam or they could ask how students have felt during the “past few weeks” or “past week” when they are about to turn in an important and laborious paper. In either instance, instructors could explore whether positive or negative emotions relate to performance. In addition, SoTL researchers can use novel methodology to explore positive and negative emotions and their relationship to college achievement. For example, recent innovations in positive and negative emotion research include exploring the within-person variability in the experience of emotions. First, researchers can assess emodiversity, the degree to which a person experiences a variety of emotions throughout the week (or past few days, or past month, etc.; see <http://www.emodiversity.org> for an equation; Quoidbach et al., 2014). Second, researchers can explore the standard deviation of positive or negative emotions throughout multiple measurement periods throughout the week to assess the degree to which people experience fluctuations in extremity of positive and negative emotions (e.g., high levels of positive emotions on one day, and then possibly none at all the next day; Gruber, Kogan, Quoidbach, & Mauss, 2013). These relatively new ways of evaluating positive and negative are a ground-breaking way of exploring emotions and college achievement.

### Subjective Well-Being Composite

Researchers commonly assess overall well-being by averaging participants’ life satisfaction and frequency of positive and (reverse-scored) negative emotions to represent the theoretical tripartite structure of well-being (Diener et al., 1999). If the three constructs are measured on different Likert scales (e.g., 1-5 vs. 1-7), researchers can transform scores to z-scores for each scale and average the standardized scores. Additionally, although life satisfaction and positive and negative emotions are typically highly correlated (Pavot, Diener, Colvin, & Sandvik, 1991), researchers should explore the correlations in their own data before combining. Although researchers have proposed more complicated ways of combining the three constructs (Busseri & Sadava, 2010), averaging them is the most common approach.

In addition to subjective well-being predicting course outcomes, SoTL researchers could also use subjective well-being and the other similar constructs as dependent variables. Research has now demonstrated a host of simple and brief activities that boost well-being (i.e., positive activities; Lyubomirsky & Layous, 2013; Sin & Lyubomirsky, 2009) and reduce the negative effects of threat on academic achievement (i.e., self-affirmation and belonging interventions; Cohen & Sherman, 2014; Walton & Cohen, 2011). Many of these activities take about 10-15 minutes and could easily be administered within a class session or online as homework. Furthermore, instructors could also test the effects of intervention-induced changes in well-being on subsequent exams or class assignments by administering the intervention, measuring well-being as a manipulation check and mediator, and then assessing performance as a behavioral outcome.

## Happiness

Rather than represent happiness with the subjective well-being composite, some researchers recommend to simply ask people if they are happy to tap whatever that person thinks it means to be happy. One such face valid measure is the 4-item Subjective Happiness Scale (SHS; Lyubomirsky & Lepper, 1999), which asks participants to consider how generally happy they are, how happy they are relative to their peers, (1 = *less happy*, 7 = *more happy*), and the extent to which a description of a “very happy” and a “very unhappy” person, respectively, characterizes them (1 = *not at all*, 7 = *a great deal*; Cronbach’s  $\alpha$ ’s > .79). Although researchers should take caution before dropping items from a validated scale, recent research suggests that negatively worded and reverse-scored items contribute to poor reliability (Gehlbach, 2015) and recent research on the SHS in specific suggests that dropping the fourth item improves scale reliability (O’Connor, Crawford, & Holder, 2014; also see Wilson-Doenges, 2015 for more discussion of this issue).

Among high school students in Hong Kong, student scores on the SHS were related to their perceptions of their school’s quality and their own grades (Kashdan & Yuen, 2007). Similarly, like the SWLS, the SHS taken at the beginning of an introductory psychology course was also related to final grades (Borrello, 2005). In addition to exploring how well-being relates to final grades, researchers could also explore whether well-being relates to exam performance or possibly just relates to final grades due to perseverance on homework assignments and class participation. Additionally, researchers could measure stress or anxiety (see Negative Aspects of Well-Being in this chapter) to explore whether well-being simply buffers the negative effects of stress on academic performance or is uniquely related.

## Eudaimonic Well-Being

The Questionnaire for Eudaimonic Well-Being (QEWB; Waterman et al., 2011) was developed to assess people’s well-being derived from the development and fulfillment of their individual potential (as opposed to just assessing how people generally feel about their lives, regardless of the source, like the life satisfaction and happiness scales). The scale includes 21 items (e.g., “My life is centered around a set of core beliefs that give meaning to my life”), which are rated on a scale ranging from 0 (*strongly disagree*) to 4 (*strongly agree*). Moreover, the scale demonstrates strong reliability, with Cronbach’s  $\alpha$  = .86. The QEWB also includes questions addressing personal identity and growth. Indeed, one study found that well-being (measured with the QEWB) significantly mediated the association between identity development (e.g., commitment making, identification with commitment) and internalizing symptoms, externalizing symptoms, and health-risk behaviors (Ritchie et al., 2013). Accordingly, instructors may wish to administer this scale in their classrooms in the context of discussing identity development in emerging adulthood.

## Meaning in Life

The Meaning in Life Questionnaire (MLQ; Steger, Frazier, Oishi, & Kaler, 2006) is one of the most widely used scales assessing life meaning. It includes 10 items to assess the presence of (e.g., “My life has a clear sense of purpose”) and search for (e.g., “I am always looking for something that makes my life feel meaningful”); 1 = *absolutely untrue*, 7 = *absolutely true*) meaning in life. Both subscales demonstrated strong reliability (Cronbach’s  $\alpha$ s = .86 and .87, respectively), as well as convergent and discriminant validity. Demonstrating the applicability across a wide range of demographics, both subscales were largely unrelated to age, gender, race, and religion (Steger et al., 2006). Instructors could contrast the MLQ and the QEWB with the SWLS and SHS to illustrate the various ways in which researchers assess well-being (see also the next few scales).

If the focus of the course is on well-being, instructors could do a more elaborate study of how these types of courses affect student well-being. For example, one study measured students’ happiness, life satisfaction, self-actualization, hope, and search for and presence of meaning in life at the beginning and end of a semester-long course on positive psychology (Maybury, 2013). Throughout the course, students completed course activities regarding their personal values and character strengths, gratitude, and optimism. Over the course of the semester, students reported gains in hope, self-actualization, life satisfaction, happiness, and search for meaning, but not presence of meaning. Accordingly, these class results may offer instructors the opportunity to discuss what makes for a happy life and the difference between *searching* for meaning in life and *feeling* that life is already meaningful.

## Psychological Well-Being

In contrast to the singular focus on meaning in life, the Scales of Psychological Well-Being (PWB; Ryff, 1989) conceptualizes well-being as including multiple facets. The PWB was originally developed as a 120-item instrument encompassing 6 subscales representing each facet (20 items per scale): self-acceptance (e.g., “I like most aspects of my personality”), positive relations with others (e.g., “I know that I can trust my friends, and they know they can trust me”), autonomy (e.g., “I am not afraid to voice my opinions, even when they are in opposition to the opinions of most people”), environmental mastery (e.g., “In general, I feel I am in charge of the situation in which I live”), purpose in life (e.g., “I have a sense of direction and purpose in life”), and personal growth (e.g., “I think it is important to have new experiences that challenge how you think about yourself and the world”). The length of this scale makes it cumbersome for use within the classroom, but instructors could present a subset of items to contrast the PWB with the aforementioned scales. Additionally, this scale is included in the Midlife in the United States study (MIDUS), a national longitudinal study of health and well-being, so interested students could request use of this data for an independent research project on how well-being relates to a host of physical health and demographic variables (<http://www.midus.wisc.edu/>).

### Psychological Flourishing

The Mental Health Continuum (MHC; Keyes, 2002) was developed as a tool for measuring mental health as a state of flourishing, rather than merely the absence of disease. Accordingly, this measure includes three subscales: emotional well-being (6 items; e.g., “How much of the time in the last 30 days did you feel full of life?”; 1 = *none of the time*, 5 = *all*; Cronbach’s  $\alpha = .91$ ), psychological well-being (18 items adapted from Ryff, 1989; e.g., “I like most parts of my personality”; 1 = *disagree strongly*, 7 = *agree strongly*;  $\alpha = .81$ ), and social well-being (15 items; e.g., “I feel close to other people in my community”; 1 = *disagree strongly*, 7 = *agree strongly*;  $\alpha = .81$ ). A 14-item short-form of the MHC (Lamers, Westerhof, Bohlmeijer, ten Klooster, & Keyes, 2011) was recently developed, including shortened versions of each of the three subscales, which also demonstrated strong reliability ( $\alpha$ s > .74 for the three subscales,  $\alpha = .89$  for the total MHC-SF). To diagnose mental health, averages for the three subscales are calculated, and those who score in the upper tertile are considered to be flourishing and those who score in the lower tertile are considered to be languishing.

### Psychological Need Satisfaction

Based on self-determination theory (Ryan & Deci, 2000), the Balanced Measure of Psychological Needs (BMPN; Sheldon & Hilpert, 2012) is an 18-item scale that measures people’s feelings of autonomy (e.g., “I was free to do things my own way”), competence (e.g., “I took on and mastered hard challenges”), and connectedness (e.g., “I felt close and connected to other people who are important to me”). Each item is rated on a scale ranging from 1 (*no agreement*) to 5 (*much agreement*). Each subscale demonstrates strong reliability, Cronbach’s  $\alpha$ s > .78.

The BMPN offers a number of advantages for classroom use. Students can complete this relatively short scale quickly, leaving plenty of time for discussion and other activities in class. In addition, the items reflect general feelings rather than domain-specific satisfaction, rendering the scale applicable to students across diverse experiences. Finally, the scale demonstrates strong reliability and validity as three independent scales or as a single scale representing overall psychological need satisfaction, which provides instructors with a variety of ways to use this scale in the classroom. For example, an instructor could administer only the connectedness subscale when discussing relationships in a course on social psychology but could administer the entire scale when discussing self-determination theory in a course on motivation.

### Optimism

Optimism is the global belief that good things will happen (i.e., generalized outcome expectancies; Scheier & Carver, 1985). The revised life orientation test (LOT-R; Scheier, Carver, & Bridges, 1994) is a 6-item measure designed to assess trait optimism. Respondents are asked to indicate their degree of general agreement “over the past year” with statements such as “I’m always optimistic about my future,” using a 5-point response scale (1 = *strongly disagree*, 5 = *strongly agree*; Cronbach’s  $\alpha > .78$ ). To measure state optimism (Kluemper, Little, & DeGroot, 2009), change the question stem to “over the past week” and re-word individual items to indicate current state of optimism with statements such as “Currently, I’m optimistic about my

future,” using a 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*). College students high in trait optimism were less likely to see their education as a source of stress in their lives (Krypel & Henderson-King, 2010), more likely to expect success (Robbins, Spence, & Clark, 1991), but were no more or less likely to achieve good grades (close to zero correlation; Robbins et al., 1991; see also Rand, Martin, & Shea, 2011).

## Hope

Distinct from optimism, hope typically relates to positive feelings about specific goals and planning to meet goals rather than generalized expectancies (Snyder et al., 2002). The 12-item Trait Hope Scale (THS; Snyder et al., 1991) includes two subscales to measure hope via agency (i.e., goal directed determination; e.g., “I energetically pursue my goals) and pathway (i.e., planning of ways to meet goals; e.g., “I can think of many ways to get the things in life that are important to me”). Each subscale includes four items, which are rated on a scale from 1 (*definitely false*) to 8 (*definitely true*). The scale demonstrated good reliability in a college student sample (agency subscale: Cronbach’s  $\alpha > .71$ , pathways subscale:  $\alpha > .63$ , total scale:  $\alpha > .74$ ). Hope positively predicts academic success in college (Snyder et al., 2002), and hope, but not optimism, positively correlates with grades for first-year law students, controlling for admissions test scores and undergraduate grades (Rand et al., 2011). Instructors may want to highlight the differences between hope and optimism and engage students in a class discussion about why hope, but not optimism, is related to academic achievement.

## Negative Aspects of Well-Being

Negative aspects of well-being can range from feelings of sadness, tension, low self-efficacy, and learned helplessness. Although many measures of clinical symptomology exist to assess students’ depressive symptoms or anxiety disorder criteria, for the purposes of this chapter, we chose to focus on non-clinical measures of stress and anxiety that generalize well to students. General feelings of stress and anxiety harm people’s health (DeLongis, Folkman, & Lazarus, 1988) and, unsurprisingly, also negatively influence students’ academic well-being and performance (Richardson, Abraham, & Bond, 2012). Self-report measures of student stress fall into two categories: (a) measures of general stress and anxiety, and (b) domain-specific stress and anxiety.

## General Stress and Anxiety

SOTL researchers and professors may wish to assess students’ general levels of stress to gauge whether they predict poorer academic performance, difficulty adjusting to college life, or other negative outcomes. The following discussion provides resources to assess these overarching levels of stress.

## College Students’ General Stress

The Social Readjustment Rating Scale (Holmes & Rahe, 1967) is a commonly used measure of life stressors but, for student populations we recommend the College Undergraduate Stress

Scale (CUSS; Renner & Mackin, 1998). The 51 items on the CUSS list major negative life stressors, such as being raped (or accused of rape), experiencing the death of a friend or family member, contracting an STD, and financial difficulties. The scale also includes less severe stressors, such as beginning a new academic semester and concerns over physical appearance. To calculate a total stress score, students add up the numerical stress values next to each item they experienced within the past year. For example, being raped carries a stress value of 100 and falling asleep in class carries a value of 40. The highest possible stress score is 3,623 and the sample from Renner and Mackin's (1998) initial validation study reported an average stress score of 1,247 ( $SD = 441$ ). Although this scale has been underutilized in the SoTL literature, one paper establishes this scale as a useful tool for teaching aspects of research methodology and data collection (Thieman, Clary, Olson, Dauner, & Ring, 2009).

A discussion of general stress levels can coincide with course material from health psychology, biopsychosocial approaches to health, and the interplay between mental states and physical outcomes. The scale also provides opportunities to discuss positive sources of stress such as getting married, getting straight A's, or attending an athletic event. Students will likely enjoy taking this easy-to-score assessment and can consider how their unique stressors affect their college experience. For future SoTL research, this scale provides a relatively short measure to gather data on a broad range of stressors. SoTL researchers may question whether academic-related stressors (e.g., finals week) pose the same levels of harm to the academic experience than non-academic-related stressors (e.g., serious illness in a close friend or family member).

### *State-Trait Measures of Stress*

The CUSS approaches stress from a life events perspective, but some instructors may prefer to assess the affective or cognitive components of stress and anxiety. One of the most common measures for anxiety is the State-Trait Anxiety Inventory (STAI; Spielberger, 1983), a 20-item measure of general and transient, state anxiety. Although the STAI is considered one of the gold standards in measuring anxiety, one potential disadvantage is that its use is fee-based through the psychological assessment company Mind Garden Inc. Some alternatives to the STAI full form are the 6-item state anxiety scale (STAI-6; Marteau and Bekker, 1992) and the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983). The STAI-6 lists six anxiety-related emotions such as "tense" and "worried." Participants complete the scale by answering the extent to which they currently feel those emotions on a 4-point scale (0 = *not at all* to 4 = *very much*). The PSS consists of 14 items assessed on a 5-point scale (0 = *never* to 4 = *very often*). These items ask participants to rate the extent to which they felt or experienced anxiety-provoking stressors (e.g., "In the last month, how often have you found that you could not cope with all the things you had to do?"). Both the STAI-6 and PSS are internally reliable (STAI-6 Cronbach's  $\alpha = .82$ ; PSS  $\alpha = .85$ ).

These state-trait assessments of stress give instructors an excellent way to illustrate the difference between personality tendencies and momentary, transient states. For more advanced discussion, state-trait assessments can illustrate the difference between moderators which tend to be personality variables and mediators which can manifest in state variables.

## Domain-Specific Stress and Anxiety

A number of measures are geared toward assessing domain-specific anxiety. For instructors seeking to enhance the specificity of their research questions, these scales offer an excellent solution. We discuss the domain-specific scales to measure test anxiety, math anxiety, computer anxiety, and social anxiety.

### Test Anxiety

For instructors examining test anxiety, the 21 true/false-item Test Anxiety Scale (Cronbach's alphas range between .68-.81; Sarason, 1984) and the 10-item Worry-Emotionality Questionnaire (Liebert & Morris, 1967) are viable options that both assess two factors presumed to underlie test anxiety: cognitive thoughts of worry, and affective or physiological emotionality. For those researchers needing a state measure of test anxiety (both factors), we recommend the 8-item State Test Anxiety scale (Hong & Karstensson, 2002).

Arguing that the cognitive component of test anxiety most strongly predicts deficits in performance, Cassady and Johnson (2002) developed a reliable (Cronbach's  $\alpha = .86$ ) 27-item scale to assess cognitive worry. The Cognitive Test Anxiety scale includes items to assess intrusive, ruminative thoughts during test-taking and engaging in social comparison or test-irrelevant thinking during test-taking. Participants respond using a 4-point scale to sample items such as, "During tests, I find myself thinking of the consequences of failing;" "When I take a test, my nervousness causes me to make careless errors;" and "During tests, the thought frequently occurs to me that I may not be too bright."

Instructors can find opportunities to illustrate the advantages and disadvantages of a moderate amount of anxiety by asking students to complete a test anxiety scale either before or after an exam. The instructor can then demonstrate whether test anxiety predicts exam grades. These scales can also open up discussion about test-taking strategies and how to improve test performance by focusing on anxiety-mitigation, metacognition, mindfulness, or other relaxation techniques.

### Computer Anxiety

As technology continues to advance, it may be difficult to imagine students' experiencing anxiety toward using computers. However, computer anxiety is very real, can influence students' attitudes toward taking computer-administered exams (Schult & McIntosh, 2004), and can negatively influence students' performance (Brosnan, 1998).

The Computer Anxiety and Learning Measure (CALM; McInerney, Marsh, & McInerney, 1999) is a 65-item measure consisting of four subscales: gaining initial computer scale (22 items), state anxiety (20 items), sense of control (12 items), and computing self-concept (11 items). The CALM is reliable (Cronbach's  $\alpha > .78$ ) and the subscales allow researchers to administer all,

some, or only one, and still gain insight regarding aspects of students' computer anxiety (see Schult & McIntosh, 2004 for a SoTL study in which only the state anxiety subscale was used).

One possible disadvantage to the CALM measure is that a few items may be outdated (e.g., questions measuring comfort using a mouse or printing documents) due to the prevalence of computers in most people's everyday lives. However, one other well-validated computer anxiety scale exists and may serve as an excellent alternative if the CALM does not meet an instructor's needs. The Computer Anxiety Scale (CAS; Lester, Yang, & James, 2005) contains six items and participants respond using a 6-point agreement anchor (strongly agree to strongly disagree). The six items load onto a single underlying factor of computer anxiety (Chronbach's  $\alpha > .74$  across multiple samples). Items such as, "I feel confident and relaxed while working on a computer" and "I can usually manage to solve computer problems by myself" make up the scale. For instructors solely seeking to assess the affective components of computer anxiety, we recommend the state subscale of the CALM; but for researchers seeking to assess cognitive components, the other four subscales of the CALM or the CAS offer practical solutions.

### **Math Anxiety**

Psychological statistics professors often quip that teaching psychological statistics is one part teaching math and one part anxiety mitigation. It comes as no surprise that several scales exist to measure students' self-reported anxieties toward math. An early, yet still widely used, measure is the Math Anxiety Scale (Betz, 1978; Fennema & Sherman, 1976). Betz (1978) rewrote 10 items from the Mathematics Attitudes Scale (Fennema & Sherman, 1976) with the goal of assessing college students' math anxiety. Participants respond to these 10 items on a 5-point agreement scale (*strongly disagree* to *strongly agree*). The items offer good reliability (split-half coefficient of .92; Betz, 1978) and measure worry about solving math problems, feelings of tension during math exams or when thinking of difficult math problems, and loss of clear thinking when working with math.

Another widely used measure is the Math Anxiety Rating Scale (MARS-R; Plake & Parker, 1982). Although the original MARS-R contained 24 items, Hopko (2003) conducted a re-validation study and reduced the measure to 12 items. Participants respond to items using a 4-point scale from 0 (*no anxiety*) to 4 (*high anxiety*). Both the original and revised versions consist of two subscales: Learning Math Anxiety and Math Evaluation Anxiety. Both subscales have good reliability (Learning Math Anxiety, Cronbach's  $\alpha = .87$ ; Math Evaluation Anxiety,  $\alpha = .85$ ; Hopko, 2003).

By assessing students' trait or state feelings before engaging in an academic task, instructors can assess whether some of the positive well-being constructs buffer against the negative effects of test or computer anxiety. For instance, students with high math anxiety tend to perform more poorly on math exams, except when they possess high metacognitive skills (Legg & Locker, 2009). The high metacognitive skill allows these students to compensate for and overcome potentially debilitating math anxiety. Instructors can also use these scales to

demonstrate peoples' varying levels of anxiety (e.g., some people may score high on math anxiety but low on computer anxiety).

### Conclusion

In sum, a variety of scales exist to measure the positive and negative aspects of trait and state well-being, and these assessments could serve as either predictors or dependent variables in research projects for SoTL scholars. Importantly, most of the scales are self-report and brief, and are therefore highly convenient for use within the classroom. In addition, although we reported some examples of instructors exploring well-being in the classroom, we also pointed out many new ways in which SoTL scores can contribute to this burgeoning literature. Lastly, not only can the scales themselves be informative to students' understanding of research constructs, but they can also help instructors understand and promote intangible emotional characteristics that might help students thrive.

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