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The Assessment of Subjective Well-Being: A Review of Common Measures

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Abstract

Subjective well-being (SWB) consists of affective components (frequent positive feelings, infrequent negative feelings) and cognitive components (evaluations of life and judgments of satisfaction). We review four commonly used measures of SWB: the Satisfaction with Life Scale (SWLS), Cantril's ladder, the Positive and Negative Affect Schedule (PANAS), and the Scale of Positive and Negative Experiences (SPANE). We conducted a meta-analysis of the reliability and validity of each measure based on studies published from 1999 to 2019. The SWLS, PANAS, and SPANE generally exhibit acceptable levels of reliability (alphas $\geq .80$) across most samples, time frame instructions, and age groups. All measures were substantially correlated with each other. However, SWLS was more strongly correlated with SPANE-P than with PANAS-PA. We discuss key differences between the PANAS and SPANE and their implications for researchers. Finally, we discuss ongoing issues with commonly used SWB measures that should be addressed by future research.

Keywords: subjective well-being, measures, scales, satisfaction, emotion, affective well-being, cognitive well-being

Subjective well-being (SWB) refers to the various ways that we experience and evaluate our lives positively (Diener, 1984; Diener, Suh, Lucas, & Smith, 1999). It includes frequent feelings of pleasant or positive affect (PA); and infrequent feelings of unpleasant or negative affect (NA). Together, PA and NA constitute the *affective* components of SWB. Also relevant are our evaluations of life (e.g., life satisfaction). These evaluations are distinct from affective experiences in that they often require us to reflect broadly upon our circumstances and whether they meet our standards. Judgments of life satisfaction or life evaluation constitute the *cognitive* component of SWB. Though the affective and cognitive components are often correlated with each other; they are also associated with different outcomes (Tay & Diener, 2011). Thus, the assessment of SWB, ideally involves the measurement of each component separately (Pavot, 2008).

SWB is sometimes referred to as *hedonic* well-being because of its emphasis on a pleasant and satisfying quality of life (Tov, 2018). This contrasts with *eudaimonic* well-being, which includes a variety of constructs like meaning, personal growth, and authenticity (Huta & Waterman, 2014; Vittersø, 2016). Theories of eudaimonic well-being focus less on the pleasantness of experience and more on the needs that people must fulfill to reach their full potential. In contrast, the SWB approach does not specify the “ingredients” required for well-being. The assessment of SWB is *subjective* in that people report their own happiness and satisfaction without reference to any particular template of life conditions or experiences. Instead, they assess their well-being using whichever standards are personally relevant and important to them.

Although eudaimonic aspects of well-being are important topics of study, our chapter focuses on measures of SWB. It is worth noting that eudaimonic well-being measures are

strongly correlated with SWB measures (Kashdan, Biswas-Diener, & King, 2008; Tov & Lee, 2016). Thus, although SWB is considered hedonic, many experiences that make us happy and satisfied are also those in which we experience meaning, growth, and authenticity. This is not to say that SWB measures can substitute for measures of eudaimonic well-being, only that the experiences captured by the former should not be dismissed as trivial and unimportant.

SWB measures are associated with important outcomes. For example, higher levels of life satisfaction and PA predict lower susceptibility to health problems and increased longevity, whereas higher levels of NA tend to predict poorer health outcomes (Diener, Pressman, Hunter, & Delgado-Chase, 2017). Employees who experience more PA and satisfaction at work are more likely to help their fellow colleagues and have lower levels of absenteeism and intentions to quit (Borman, Penner, Allen, & Motowidlo, 2001). Subjective reports of well-being provide valuable information beyond objective economic indicators in the evaluation of social and economic policies (Diener & Seligman, 2004; Diener & Tov, 2012; Dolan & White, 2007).

In our chapter, we expand on previous reviews of SWB measures (Boyle, Helmes, Matthews, & Izard, 2015; Diener, 1994; Weber, Harzer, Huebner, & Hills, 2015). Due to space constraints, our review is not comprehensive. Instead, we focus primarily on measures that have been validated for use on adult samples; and are free to use for research purposes. Consequently, the scales we have selected are highly accessible and have been widely used, thus establishing a deep empirical base. We review four of the most commonly used measures in depth. Two scales assess the cognitive component of SWB: the Satisfaction with Life Scale (SWLS) and Cantril's ladder. Two scales assess the affective components of SWB: the Positive and Negative Affect Schedule (PANAS) and the Scale of Positive and Negative Experiences (SPANES).

We supplement our review with meta-analyses of the reliabilities of these scales and their correlation with each other. Thus we report meta-analytic average reliabilities (Cronbach's alpha; $\bar{\alpha}$) and correlations (\bar{r}). To provide a clear reference for researchers, studies were only included in our meta-analyses if they used the standard format of the scale (i.e., the original number of items and rating scale). Studies that used a subset of items or a different number of scale points or rating labels were excluded. We caution readers that our selection of studies was limited to studies published from 1999 to 2019, with special attention to those that (i) employed non-Western samples; or (ii) examined change and stability in SWB. Our intention was to highlight the diverse contexts in which these measures have been employed. Thus, although we provide meta-analytic estimates, we also report heterogeneity across studies. Detailed listings of the studies we reviewed and included in our meta-analysis, as well as supplementary information on our meta-analytic approach and codes used to perform the analyses are available as online supplements at <https://osf.io/q2vtx>. When appropriate, we highlight other measures of SWB that may also be useful to researchers depending on their goals and objectives.

Measuring Cognitive Well-Being

Researchers often ask respondents to evaluate how they think and feel in general. Such evaluations are referred to as *global* judgments. In the case of cognitive well-being, global measures ask people to evaluate their life “as a whole” Other measures elicit satisfaction with specific life domains (e.g., health or relationships), and we introduce some of them later. However, the two measures of cognitive well-being that we review are strictly global measures. Both scales draw on discrepancy theories of well-being (e.g., Campbell, 1976; Michalos, 1985), which assume a comparison process whereby people evaluate their current life conditions with how they would like things to be (i.e., their standards). The smaller the discrepancy between

their current circumstances and what they desire, the more positively they should evaluate their lives as a whole. Other processes may also be involved. Bottom-up theories propose that people summarize their momentary experiences over time with the final balance of pleasant (versus unpleasant) experiences influencing how they feel about their lives overall. In contrast, top-down theories suggest that certain people are predisposed to experience and interpret their lives positively or negatively. Support for both theories exist (Heller, Watson, & Ilies, 2004; Tov, 2012), and the measures we discuss do not preclude the influence of other factors and mechanisms. For a review of theoretical accounts of well-being, see Diener (1984).

Cantril's Ladder (Self-Anchoring Striving Scale)

The Self-Anchoring Striving Scale invites respondents to evaluate their life according to their own goals, values, and standards (Cantril, 1965; Kilpatrick & Cantril, 1960). It is commonly referred to as Cantril's ladder. In its original form, an interviewer asked respondents to describe the *best possible* life for themselves by reporting their wishes and hopes for the future. They were then asked to describe the *worst possible* life for themselves by reporting their fears and worries for the future. The interviewer wrote down verbatim these descriptions, which could then be content coded. The entire exercise was meant to establish a "self-defined continuum" (Kilpatrick & Cantril, 1960, p. 158), with which respondents placed their current life. To facilitate this placement, a picture of a ladder with 10 rungs was shown to the respondent—with 10 (at the top of the ladder) representing the best possible life, and 0 (the bottom of the ladder) representing the worst possible life. Respondents indicated where they "stand at the present time." They would then be asked to evaluate where they stood 5 years ago and where they think they will stand 5 years into the future.

In its more common use, respondents are instructed to imagine a ladder with steps numbered from 0 to 10, with 0 representing the “worst possible life for you” and 10 representing the “best possible life for you”. Respondents’ hopes and fears are not often collected. Although some surveys assess life evaluations of the past and future (e.g., Gallup Organization, n.d.), many researchers use the single-item evaluation of current or present life. We examined 26 studies that used the ladder and summarized its psychometric properties.

Reliability. Responses to the ladder appear to be substantially stable over the short term. Over intervals ranging from two to four weeks, retest intervals ranged from .58 to .70 in Scottish adolescents (ages 11-15; Levin & Currie, 2014) and .71 in a sample of U.S. adults (Kapteyn, Lee, Tassot, Vonkova, & Zamarro, 2015).

Validity. Cantril’s ladder correlates strongly with the SWLS. Across five studies ($N = 762$), the average r was .68 (95% CI [.56; .76]). Ladder scores are also positively associated with measures of PA and negatively with NA (see Table 1 and also Joshanloo, 2019). Cantril’s ladder is also associated with higher levels of eudaimonic well-being (Keyes, Shmotkin, & Ryff, 2002), greater income (Diener, Ng, Harter, & Arora, 2010), better self-reported health, being employed, and having a partner (Kapteyn et al., 2015). In large samples representative of 95% of the world population, ladder scores were positively associated with meeting basic needs and income (Tay & Diener, 2011). The online materials summarize additional studies using the ladder.

Use in interventions. Shapira, Barak, and Gal (2007) conducted a 15-week computer skills course for older adults. Controlling for pretest scores, posttest ladder scores were higher for those in the treatment group. However, the effect could be attributed to the control group decreasing (rather than the treatment increasing) their ladder evaluation. Few other studies have

used Cantril's ladder to evaluate intervention effectiveness, although it is commonly used to assess quality of life in clinical and medical research.

Satisfaction with Life Scale (SWLS)

The SWLS (Diener, Emmons, Larsen, & Griffin, 1985) is a widely used measure of global cognitive well-being. There are over 30 translations of the scale, many of which can be downloaded from Ed Diener's website (<https://eddiener.com/scales/7>). The SWLS consists of five items, including "In most ways my life is close to my ideal" and "I am satisfied with my life," rated on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). When responses are summed across the five items, the scores range from 5 (low satisfaction) to 35 (high satisfaction). This is the standard format of the SWLS, and our review and meta-analysis only include studies that used this format.

Reliability. Across 103 samples ($N = 106,599$ individuals), the SWLS generally exhibited high levels of internal consistency ($\bar{\alpha} = .86$, 95% CI [.85; .87]). However, there was significant heterogeneity across samples, $Q(102) = 3348.22$, $p < .001$. Table 2 presents reliabilities by different subgroups. Although alphas were over .80 in most translations of the scale, they were lower among Bulgarian, Arabic, and Cantonese versions. Reliabilities did not vary with gender composition (i.e., the percentage of female respondents), but were somewhat higher in older age samples. Recent studies reported test-retest correlations from .73 over one year (Ilies, Yao, Curseu, & Liang, 2019) to .80 over a one-month period (Steger, Frazier, Oishi, & Kaler, 2006). Life satisfaction, as measured by the SWLS, appears to be highly stable over the short-term (one-month period) but may also change in the long term as suggested by lower test-retest correlations over time.

Validity. The one-factor structure of the SWLS has been supported in 41 countries (Vittersø, Røysamb, & Diener, 2002). SWLS scores are associated with higher scores on measures of PA ($\bar{r}'s \geq .46$) and lower scores on measures of NA ($\bar{r}'s \leq -.39$; Table 1). These correlations are not extremely high, suggesting that the SWLS captures aspects of well-being that are distinct from affective experience. By comparison, the SWLS correlates more strongly with Cantril's ladder and other single-item measures of life satisfaction (.62 to .64; Cheung & Lucas, 2014). This pattern is consistent with the notion that SWB consists of distinct cognitive and affective components. The SWLS also shows convergent validity with other relevant constructs, such as optimism (Chang et al., 2019); and meaning in life (Steger et al., 2006). Although the SWLS does not specify the standards people use to judge their life satisfaction, it correlates with major aspects of life such as income, and satisfaction with health and work (Ilies et al., 2019; Kapteyn et al., 2015).

Use in interventions. There is some evidence that positive psychology interventions (PPI) aimed at improving well-being can enhance life satisfaction as measured by SWLS (Boehm, Lyubomirsky, & Sheldon, 2011; Lam & Kahler, 2018; Lambert, Passmore, & Joshanloo, 2019). However, an eight-week intervention teaching older adults how to cultivate meaningful positive experiences found no change in SWLS (Friedman et al., 2019). Thus, although SWLS scores can change meaningfully in response to psychological interventions, other factors such as sample characteristics and type of intervention may affect the extent to which changes are observed.

Considerations for Selecting Cognitive Well-Being Measures

The appeal of the single-item Cantril's ladder is its brevity. The layout of the ladder scale may also provide a helpful visual metaphor for evaluating one's life. Even over the telephone,

Cantril's ladder may be a simpler way to elicit evaluations of one's life as a whole. However, as a paper-based or Internet-based survey item, it is not clear if Cantril's ladder provides any distinct advantages over the SWLS. The time that might be saved by using a single item is offset by longer written instructions encouraging respondents to think about the best and worst possible life they could live. Although Cheung and Lucas (2014) provided evidence that single-item life satisfaction scales were as valid as the SWLS, their analyses were based on large survey samples, often exceeding 1000 people. It is unclear whether similar results apply to smaller sample sizes. This is especially so when evaluating the effect of an intervention since the change from pretest to posttest of a single-item measure may contain more measurement error than that of a multi-item measure (Schneider & Schimmack, 2009). Thus, if sample sizes are smaller than those commonly found in large surveys, a multi-item instrument like the SWLS might be preferable.

Another consideration is whether the researcher wants to know how satisfied a person is with specific areas of life. The SWLS and Cantril's ladder only assess global life satisfaction. In contrast, measures that assess *domain satisfaction* include the Personal Wellbeing Index (PWI; International Wellbeing Group, 2013) and the Extended Life Satisfaction Scale (ESWLS; Alfonso, Allison, & Rader, 1996). The PWI assesses satisfaction with standard of living, health, achievement, relationships, safety, community, future security, and spirituality. The ESWLS measures satisfaction with social life, sex life, physical appearance, family life, education, job, and relationship/marriage. In theory, one could average satisfaction across the domains to derive a measure of overall satisfaction. However, such an index may not be the same as global satisfaction measured by the SWLS or Cantril's ladder. Although domain satisfaction measures tap major aspects of life, it is impossible for them to capture standards that are idiosyncratic to

each person. In recognition of this possibility, both the PWI and ESWLS include items to assess global satisfaction.

Finally, most measures focus on how people feel about their current life. Researchers interested in how people evaluate their past or future might consider the Temporal Satisfaction with Life Scale (Pavot, Diener, & Suh, 1998), which contains 15 items divided equally among assessments of past life, current life, and future life satisfaction. Cantril's ladder has also been used in a similar manner (Cantril, 1965; Kilpatrick & Cantril, 1960). An assumption of such measures is that how a person evaluates their life currently may not fully reflect their experiences or motivation. Busseri, Choma, and Sadava (2009) have shown that a temporally expanded assessment of well-being may yield insights beyond current levels of well-being.

Measuring Affective Well-Being

Affective measures of SWB emphasize the valence (pleasantness or unpleasantness) of our moods and emotion. According to theories of emotion (Ellsworth & Scherer, 2009; Weiner, 1985), the valence of an event is one of the first features that we appraise ("Did something good or bad happen?"), often followed by subjective feelings of PA or NA. Affective well-being and cognitive well-being often correlate with each other. Our standards for what we desire in life are likely to influence how we evaluate the current conditions of our life (cognitive well-being) as well as whether we experience certain events as positive or negative (affective well-being). A key difference may be that cognitive well-being tends to reflect more stable aspects of life (Schimmack & Oishi, 2005), whereas affective well-being tends to reflect our reactions to ongoing events or experiences (Luhmann, Hawkley, Eid, & Cacioppo, 2012).

Self-reported affect can be measured at different levels (Kim-Prieto, Diener, Tamir, Scollon, & Diener, 2005; Tov, 2012, 2018). *Global* measures ask respondents to report how they

feel in general. *Retrospective* measures ask respondents to report how they felt during a specific time frame (e.g., over the past month). *Online* measures ask respondents to report how they feel in the current moment. The two measures of affective well-being that we review could be used to assess affect at any level by modifying the instructions accordingly.

Positive and Negative Affect Schedule (PANAS)

The PANAS (Watson, Clark, & Tellegen, 1988) consists of two 10-item scales, focusing on positive and negative states that are somewhat independent. The Positive Affect scale (PANAS-PA) measures the extent to which a person feels pleasantly alert (e.g., *excited*, *attentive*, *inspired*); the Negative Affect (PANAS-NA) scale measures the extent of distress and unpleasurable engagement (e.g., *nervous*, *hostile*, *upset*). Each item is rated on a 5-point scale (1 = *very slightly or not at all*, 5 = *extremely*). In its original development, the PANAS was administered using seven different time frame instructions: (1) *right now* (at the present moment), (2) *today*, (3) during the *past few days*, (4) during the *past week*, (5) during the *past few weeks*, (6) during the *past year*, and (7) *in general* (on average). Below we summarize our observations of the PANAS across 54 published articles.

Reliability. Across 64 samples ($N_{PA} = 22,920$ and $N_{NA} = 25,887$), average reliabilities were acceptable for both PANAS-PA ($\bar{\alpha} = .86$, 95% CI [.85; .87]) and PANAS-NA ($\bar{\alpha} = .85$, 95% CI [.84; .86]). However, significant heterogeneity was observed for PANAS-PA ($Q[63] = 924.00$) and PANAS-NA ($Q[63] = 1143.91$), p 's < .001. Reliabilities across different subgroups and time frame instructions are presented in Table 3. Alphas were generally acceptable, ranging from .80 to .92, across different translations and time frame instructions. However, the reliabilities of PANAS-PA and PANAS-NA were positively related to the mean age of the

sample (r 's $> .37$, p 's $\leq .006$). Lower alphas were observed among respondents younger than 18.¹

Test-retest correlations of the PANAS may depend on the time frame specified, with higher correlations for *in general* instructions, and smaller correlations for *present moment* instructions (Watson et al., 1988). For instance, Terraciano, McCrae, and Costa (2003) reported three-month retest correlations for PANAS-PA and PANAS-NA of .65 and .52 (*present moment*) and .76 and .73 (*general*), respectively. This pattern is expected given that global affect should be more stable than retrospective and online affect.

Validity. Recent studies support the two-factor structure of the PANAS with PA items and NA items loading more strongly on their respective factors. However, correlated errors are also present among subsets of items (Crawford & Henry, 2004; Lim, Yu, Kim, & Kim, 2010; Merz & Roesch, 2011). For example, *guilty* and *ashamed* are correlated with other NA items (e.g., *angry* and *hostile*) but also reflect experiences that the latter do not—such as reactions to one's own wrongdoing. Table 1 presents correlations with past-month PANAS (to facilitate comparisons with the SPANE). Although PANAS-PA and PANAS-NA are conceptualized as independent factors, they tend to be inversely related (e.g., $\bar{r} = -.35$; Table 1). Past-month PANAS-PA was associated with higher levels of cognitive well-being (\bar{r} 's $\geq .46$), whereas past-month PANAS-NA was associated with lower levels (\bar{r} 's $\leq -.39$). The online materials report PANAS correlations at other time frames and the results of additional studies using the PANAS.

Use in interventions. A one-month mindfulness-based intervention led to increased PANAS-PA and decreased PANAS-NA (past-week; Bailey et al., 2018). An 8-week PPI led to

¹ A child version of the PANAS has been developed (Laurent et al., 1999).

significant increases in PANAS-PA but did not affect PANAS-NA within a chronic pain population (present moment; Boselie, Vancleef, & Peters, 2018). However, other PPIs had no overall effect on PANAS scores (Lam & Kahler, 2018; Woodworth, O'Brien-Malone, Diamond, & Schüz, 2016). We discuss possible reasons for these inconsistencies later (see “Considerations for Selecting Affective Well-Being measures”).

Scale of Positive and Negative Experience (SPANE)

The SPANE (Diener, Wirtz, et al., 2010) consists of 12 items with six items each measuring PA (SPANE-P scale) and NA (SPANE-N scale). Although two separate scores are produced, a difference score is sometimes computed (SPANE-B) by subtracting SPANE-N from SPANE-P. The SPANE was developed to address the limitations of the PANAS as a measure of SWB. As a hedonic well-being construct, SWB emphasizes the pleasantness and unpleasantness of affective experience. Although the PANAS measures valence, the items refer primarily to high arousal affective states (e.g., *excited* and *jittery*). Common emotions like happiness and sadness are not directly assessed by the PANAS.

The SPANE includes both general affective terms (e.g., *good*, *bad*, *pleasant*, *unpleasant*) along with more specific but commonly experienced states (e.g., *happy*, *sad*, *contented*, *angry*). By including more general terms, a range of affective experiences may be captured by the SPANE—whether they are high or low arousal states. The SPANE also uses a frequency-based rating scale (1 = *very rarely or never*, 5 = *very often or always*) in line with research showing that well-being judgments (e.g., life satisfaction) correlate more strongly with the frequency than intensity of affective experiences (Diener, Sandvik, & Pavot, 1991). In the original SPANE, participants rate how often they experienced each feeling during the *past four weeks*, and most of the studies we reviewed used this time frame (67%). Busseri (2018) conducted a meta-analysis

of the SPANE based on studies published through 2015. We supplemented his analysis with more recent studies. However, given our focus on the instrument itself, we excluded studies that used only a subset of the SPANE items. We also restricted our review to studies that used a five-point frequency-based rating scale.

Reliability. Across 46 samples ($N = 38,823$), average reliabilities were acceptable for the SPANE-P ($\bar{\alpha} = .87$, 95% CI [.85; .89]) and SPANE-N ($\bar{\alpha} = .82$, 95% CI [.80; .85]). Across 33 samples ($N = 33,913$), the reliability of SPANE-B ($\bar{\alpha} = .87$, 95% CI [.85; .89]) was comparable to SPANE-P. Nevertheless, significant heterogeneity was observed for SPANE-P ($Q[45] = 1750.61$), SPANE-N ($Q[45] = 2331.11$), and SPANE-B ($Q[32] = 1157.24$), p 's < .001.

Reliabilities for different translations, time frame instructions, and age groups are presented in Table 4). Alphas were extremely poor ($\leq .59$) for a Persian and Swedish version of the SPANE (Kormi-Nouri, Farahani, & Trost, 2013).² Otherwise, alphas were above .82 for SPANE-P and above .78 for SPANE-N across most translations, time frame instructions, and age groups. The reliability of SPANE scores did not vary significantly as a function of age or gender composition of the sample, although more research is needed on both adolescent and older adult samples. One-month retest correlations for the SPANE scales were above .57 (Diener, Wirtz, et al., 2010; Rahm, Heise, & Schuldt, 2017; Sumi, 2014b). Despite referencing the past four weeks, SPANE scores appear to reflect fairly stable levels of affective well-being.

Validity. Several studies suggest that the items constituting SPANE-P and SPANE-N represent distinct but correlated factors (e.g., Jovanović, 2015; Rahm et al., 2017; Sumi, 2014a). Correlated errors were also present in some studies (Kyriazos, Stalikas, Prassa, & Yotsidi, 2018; Li, Bai, & Wang, 2013). Thus, although the items broadly measure positive and negative

² Kormi-Nouri et al. (2013) attributed these low reliabilities to four items (joyful, contented, angry, and afraid) that had low item-total correlations on their respective scales. It is unclear how the items were translated.

feelings, subsets of items may share other characteristics (e.g., *good*, *pleasant*, and *positive* are more general in nature). On average, SPANE-P and SPANE-N scores are inversely correlated ($\bar{r} = -.57$; Table 1). Moreover, SPANE-P is associated with higher levels of cognitive well-being (r 's $\geq .59$), whereas SPANE-N is associated with lower levels (r 's $< -.43$). The online materials include a detailed list of 41 studies and additional correlates of the SPANE scales.

Use in interventions. After a 12-week intervention program, participants reported significantly enhanced (lowered) SPANE-P (SPANE-N) scores, relative to a control group (Heintzelman et al., 2020). Participants that used a mindfulness-based smartphone app over ten sessions experienced a significant increase in affect balance (SPANE-B) compared to an active control group (Economides, Martman, Bell, & Sanderson, 2018). Rahm et al. (2017) observed significant increases (decreases) in SPANE-P (SPANE-N) after a four-week PPI. Killen and Macaskill (2015) observed significant increases in SPANE-B after a 14-day PPI.

Considerations for Selecting Affective Well-Being Measures

The PANAS has been the dominant measure of affect over the past twenty years, with strong psychometric properties across global, retrospective, and online instructions. The SPANE, as it has typically been used, measures affect over the past four weeks and is thus a retrospective measure. It can be adapted to measure global and online affect by modifying the instructions in a manner similar to the PANAS. However, the SPANES' frequency-based response scale can be awkward when assessing current mood (e.g., "How much are you experiencing each of the following feelings *right now*?"). We suggest that the response scale be modified if the SPANE is used to measure online affect; an intensity format similar to the one used by the PANAS may be more appropriate.

Although a strength of the PANAS is its versatility across different time frames, a limitation is its emphasis on high arousal affective states. Conceptually, SWB encompasses the full range of pleasant and unpleasant affect—including *both* high and low arousal states. In contrast to the PANAS, the SPANE aims to measure a wide variety of pleasant and unpleasant states regardless of how arousing they are. Moreover, the SPANE rating scale emphasizes the frequency of affective experiences, which is more predictive of SWB judgments than the intensity of such experiences (Diener et al., 1991). These differences may have important implications for researchers.

In selecting an intervention outcome measure, researchers should consider whether high arousal states (e.g., alertness or hostility) are necessarily targeted by the intervention. For example, many PPIs (e.g., writing three good things that happened today) are intended to increase positive feelings, but not necessarily arousal. This may partly explain why mixed results were obtained when affective well-being was assessed using the PANAS (Boselie et al., 2018; Lam & Kahler, 2018; Woodworth et al., 2016), whereas studies using the SPANE yielded positive results (Killen & Macaskill, 2015; Rahm et al., 2017).

Another consideration is the cultural context from which participants are sampled. East Asian cultures tend to deemphasize high arousal positive emotions in favor of low arousal emotions, such as feeling *calm* and *relaxed* (Tsai, Knutson, & Fung, 2006). These low arousal states can influence a person's sense of well-being but are not directly measured by PANAS. If the goal is to assess SWB broadly, the SPANE may be preferred, given its generality and emphasis on affective frequency (Busseri, 2018; Diener, Wirtz, et al., 2010). This is further supported by our meta-analytic results (Table 1). For instance, the SWLS correlated more strongly with past-month SPANE-P ($\bar{r} = .59$, 95% CI [.54; .63]) than past-month PANAS-PA (\bar{r}

= .46, 95% CI [.40; .52]). Moreover, past-month SPANE-P and SPANE-N are more strongly correlated with each other (95% CI [-.62; -.52]) than are past-month PANAS-PA and PANAS-NA (95% CI [-.42; -.27]). Stronger intercorrelations among SWLS and SPANE may be desirable for researchers seeking reliable indicators of overall SWB.

A limitation of the PANAS and SPANE is that they primarily measure the valence of affective experiences. However, there are important differences between both positive and negative emotions. For example, feelings of gratitude predict helping behavior in ways that general happiness may not (Bartlett & DeSteno, 2006). Scales designed to measure more specific emotions include the PANAS-X (Watson & Clark, 1994), and the Differential Emotions Scale (DES-IV; Izard, Libero, Putnam, & Haynes, 1993). In addition, researchers interested in the full range of valence and arousal might consider the UWIST Mood Adjective Checklist (UMACL; Matthews, Jones, & Chamberlain, 1990) and the Brief Mood Introspection Scale (BMIS; Mayer & Gaschke, 1988).

In the interest of reducing recall biases, methods for assessing online affect are increasingly popular. For example, the experience sampling method makes use of handheld devices (e.g., smartphones) to survey people on how they are feeling at randomly selected moments during the day (for reviews, see Augustine & Larsen, 2012; Scollon, Kim-Prieto, & Diener, 2003). Another popular approach is the Day Reconstruction Method (DRM; Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004), in which respondents recall the events they experienced the previous day and rate how they felt during these events. For a useful comparison of these two approaches, see Lucas et al. (2020).

Remaining Issues and Future Directions

Many researchers have translated SWB scales and evaluated their factor structure, reliability, and validity in new samples of respondents. However, there is a need for researchers to assess the cross-cultural equivalence of SWB measures. This is critical insofar as there is much interest in comparing well-being across cultures by researchers (Tov & Au, 2013; Tov & Nai, 2018), policymakers (Helliwell, Layard, & Sachs, 2018), and the general public (e.g., Hetter, 2019). Jang et al. (2017) examined the equivalence of SWLS items across 26 countries and observed possible bias in some items. Their analyses suggested Items 1 and 3 (reported in the “Satisfaction with Life Scale” section) were interpreted most consistently across nations.

Fewer studies have evaluated the measurement equivalence of the PANAS and SPANE. Some researchers have employed the original English version of the PANAS to culturally diverse samples and examined the factor structure of the items. In one study, several items, including *proud* and *jittery*, did not load onto their hypothesized factors (Thompson, 2007). The item *alert* loaded on both the PA and NA factors in a Chinese sample who completed the PANAS in Chinese (Zhang, Yang, & Wang, 2009). These discrepancies could be due to non-equivalent translations. However, when Singaporean and U.S. respondents both completed the PANAS in English, the extent to which certain items loaded onto their hypothesized factors differed (Lee, Hartanto, Yong, Koh, & Leung, 2019). The item *proud (guilty)* did not load as strongly on the PA (NA) factor in the Singaporean sample as it did in the U.S. sample. Thus other factors may be important such as cultural norms that influence emotional experiences (Eid & Diener, 2001). For additional discussion of cultural measurement issues, refer to Oishi (2018).

Another concern with SWB measures is the potential for biases in memory and judgment to distort ratings of self-reported global well-being. These include possible effects of mood, question framing, and item order on participants’ responses (Schwarz & Strack, 1999). For

example, a low rating on life satisfaction might simply reflect a person's bad mood when reporting. To minimize these effects, some scholars have promoted online measures or detailed assessments such as the DRM (Kahneman et al., 2004). However, recent studies suggest that mood and order effects have a minimal impact on self-reported global SWB (Jayawickreme, Tsukayama, & Kashdan, 2017; Schimmack & Oishi, 2005; Yap et al., 2017). In addition, Tov (2012) showed that global SWB was predicted by the *cumulative effects* of events that were experienced over the past few weeks. Importantly, biases in the specific events that were recalled or how they were remembered did not affect global judgments above and beyond these cumulative effects.

Instead of viewing online reports of well-being as “accurate” and global or retrospective reports as “inaccurate,” we suggest that each type of measure captures information that is relevant to understanding a person's well-being. Global and retrospective measures are not simply aggregates of momentary well-being. They are related to our online experiences, but they are also influenced by our personality, our values and the cultural norms that influence our behavior and standards (Scollon, Howard, Caldwell, & Ito, 2009; Suh, Diener, Oishi, & Triandis, 1998; Tov, 2012). An important direction for future research is to understand better the interrelationships among online, retrospective, and global measures (Kim-Prieto et al., 2005), how these may differ for affective and cognitive well-being, and whether they are associated with different outcomes.

The past decades have seen many advances in our understanding of well-being and the broader notion of happiness. These would not have been possible without some way to measure SWB. Much work remains to improve these scales and better understand their properties.

Nevertheless, existing measures have provided a good foundation for future measures to build upon.

References

- Alfonso, V. C., Allison, D. B., & Rader, D. E. (1996). The Extended Satisfaction With Life Scale: Development and psychometric properties. *Social Indicators Research, 38*, 275–301. doi: 10.1007/BF00292049
- Augustine, A. A., & Larsen, R. J. (2012). Emotion research. In M. R. Mehl & T. S. Conner (Eds.), *Handbook of research methods for studying daily life*. (pp. 497–510). New York, NY: Guilford Press. APA PsycInfo (2012-05165-027).
- Bailey, N., Nguyen, J., Bialylew, E., Corin, S., Gilbertson, T., Chambers, R., & Fitzgerald, P. (2018). Effect on Well-Being from an Online Mindfulness Intervention: “Mindful in May.” *Mindfulness, 9*, 1637–1647. Retrieved from eoah.
- Bartlett, M. Y., & DeSteno, D. (2006). Gratitude and Prosocial Behavior: Helping When It Costs You. *Psychological Science, 17*, 319–325. doi: 10.1111/j.1467-9280.2006.01705.x
- Boehm, J. K., Lyubomirsky, S., & Sheldon, K. M. (2011). A longitudinal experimental study comparing the effectiveness of happiness-enhancing strategies in Anglo Americans and Asian Americans. *Cognition and Emotion, 25*, 1263–1272. doi: 10.1080/02699931.2010.541227
- Borman, W. C., Penner, L. A., Allen, T. D., & Motowidlo, S. J. (2001). Personality predictors of citizenship performance. *International Journal of Selection and Assessment, 9*, 52–69. doi: 10.1111/1468-2389.00163
- Boselie, J. J. L. M., Vancleef, L. M. G., & Peters, M. L. (2018). Filling the glass: Effects of a positive psychology intervention on executive task performance in chronic pain patients. *European Journal of Pain, 22*, 1268–1280.

- Boyle, G. J., Helmes, E., Matthews, G., & Izard, C. E. (2015). Measures of affect dimensions. In G. J. Boyle, D. H. Saklofske, & G. Matthews (Eds.), *Measures of personality and social psychological constructs*. (pp. 190–224). doi: 10.1016/B978-0-12-386915-9.00008-5
- Busseri, M. A. (2018). Examining the structure of subjective well-being through meta-analysis of the associations among positive affect, negative affect, and life satisfaction. *Personality and Individual Differences, 122*, 68–71. doi: 10.1016/j.paid.2017.10.003
- Busseri, M. A., Choma, B. L., & Sadava, S. W. (2009). Functional or fantasy? Examining the implications of subjective temporal perspective “trajectories” for life satisfaction. *Personality and Social Psychology Bulletin, 35*, 295–308. doi: 10.1177/0146167208327215
- Campbell, A. (1976). Subjective measures of well-being. *American Psychologist, 31*, 117–124. doi: 10.1037/0003-066X.31.2.117
- Cantril, H. (1965). *The pattern of human concerns*. New Brunswick, NJ: Rutgers University Press.
- Chang, E. C., Yi, S., Liu, J., Kamble, S. V., Zhang, Y., Shi, B., ... Chang, O. D. (2019). Coping behaviors as predictors of hedonic well-being in Asian Indians: Does being optimistic still make a difference? *Journal of Happiness Studies*. doi: 10.1007/s10902-019-00087-w
- Cheung, F., & Lucas, R. E. (2014). Assessing the validity of single-item life satisfaction measures: Results from three large samples. *Quality of Life Research, 23*, 2809–2818. doi: 10.1007/s11136-014-0726-4
- Crawford, J. R., & Henry, J. D. (2004). The Positive and Negative Affect Schedule (PANAS): Construct validity, measurement properties and normative data in a large non-clinical

- sample. *British Journal of Clinical Psychology*, *43*, 245–265. doi: 10.1348/0144665031752934
- Diener, E. (1984). Subjective well-being. *Psychological Bulletin*, *95*, 542–575.
- Diener, E. (1994). Assessing subjective well-being: Progress and opportunities. *Social Indicators Research*, *31*, 103–157. doi: 10.1007/BF01207052
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction With Life Scale. *Journal of Personality Assessment*, *49*, 71–75. doi: 10.1207/s15327752jpa4901_13
- Diener, E., Ng, W., Harter, J., & Arora, R. (2010). Wealth and happiness across the world: Material prosperity predicts life evaluation, whereas psychosocial prosperity predicts positive feeling. *Journal of Personality and Social Psychology*, *99*, 52–61.
- Diener, E., Pressman, S. D., Hunter, J., & Delgado-Chase, D. (2017). If, why, and when subjective well-being influences health, and future needed research. *Applied Psychology: Health and Well-Being*, *9*, 133–167. doi: 10.1111/aphw.12090
- Diener, E., Sandvik, E., & Pavot, W. (1991). Happiness is the frequency, not the intensity, of positive versus negative affect. In F. Strack, M. Argyle, & N. Schwarz (Eds.), *Subjective well-being: An interdisciplinary perspective* (pp. 119–139). Elmsford, NY: Pergamon Press.
- Diener, E., & Seligman, M. E. P. (2004). Beyond money: Toward an economy of well-being. *Psychological Science in the Public Interest*, *5*, 1–31.
- Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, *125*, 276–302. doi: 10.1037/0033-2909.125.2.276

- Diener, E., & Tov, W. (2012). National accounts of well-being. In K. C. Land, A. C. Michalos, & M. J. Sirgy (Eds.), *Handbook of social indicators and quality of life research* (pp. 137–156). New York, NY: Springer.
- Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D., Oishi, S., & Biswas-Diener, R. (2010). New well-being measures: Short scales to assess flourishing and positive and negative feelings. *Social Indicators Research*, *97*, 143–156.
- Dolan, P., & White, M. P. (2007). How can measures of subjective well-being be used to inform public policy? *Perspectives on Psychological Science*, *2*, 71–85.
- Economides, M., Martman, J., Bell, M., & Sanderson, B. (2018). Improvements in stress, affect, and irritability following brief use of a mindfulness-based smartphone app: A randomized controlled trial. *Mindfulness*, *9*, 1584–1593.
- Eid, M., & Diener, E. (2001). Norms for experiencing emotions in different cultures: Inter- and intranational differences. *Journal of Personality and Social Psychology*, *81*, 869–885.
doi: 10.1037//0022-3514.81.5.869
- Ellsworth, P. C., & Scherer, K. R. (2009). Appraisal processes in emotion. In R. J. Davidson, K. R. Scherer, & H. H. Goldsmith (Eds.), *Handbook of affective sciences* (pp. 572–595). New York, NY: Oxford University Press.
- Friedman, E. M., Ruini, C., Foy, C. R., Jaros, L., Love, G., & Ryff, C. D. (2019). Lighten up! A community-based group intervention to promote eudaimonic well-being in older adults: A multi-site replication with 6 month follow-up. *Clinical Gerontologist*. doi: 10.1080/07317115.2019.1574944

- Gallup Organization. (n.d.). Understanding how Gallup uses the Cantril scale. Retrieved July 12, 2019, from Gallup.com website: <https://news.gallup.com/poll/122453/Understanding-Gallup-Uses-Cantril-Scale.aspx>
- Heintzelman, S. J., Kushlev, K., Lutes, L. D., Wirtz, D., Kanippayoor, J. M., Leitner, D., ... Diener, E. (2020). ENHANCE: Evidence for the efficacy of a comprehensive intervention program to promote subjective well-being. *Journal of Experimental Psychology: Applied*, 26(2), 360–383. <https://doi.org/10.1037/xap0000254>
- Heller, D., Watson, D., & Ilies, R. (2004). The role of person versus situation in life satisfaction: A critical examination. *Psychological Bulletin*, 130, 574–600. doi: 10.1037/0033-2909.130.4.574
- Helliwell, J. F., Layard, R., & Sachs, J. (Eds.). (2018). *World Happiness Report 2018*. New York, NY: Sustainable Development Solutions Network.
- Hetter, K. (2019, March 20). World's happiest country for 2019 revealed. Retrieved July 13, 2019, from CNN website: <https://www.cnn.com/travel/article/worlds-happiest-countries-united-nations-2019/index.html>
- Huta, V., & Waterman, A. S. (2014). Eudaimonia and its distinction from hedonia: Developing a classification and terminology for understanding conceptual and operational definitions. *Journal of Happiness Studies*, 15, 1425–1456. doi: 10.1007/s10902-013-9485-0
- Ilies, R., Yao, J., Curseu, P. L., & Liang, A. X. (2019). Educated and happy: A four-year study explaining the links between education, job fit, and life satisfaction. *Applied Psychology*, 68, 150–176. doi: 10.1111/apps.12158

- International Wellbeing Group. (2013). *Personal Wellbeing Index: 5th Edition*. Retrieved from Centre on Quality of Life, Deakin University website:
<http://www.acqol.com.au/instruments#measures>
- Izard, C. E., Libero, D. Z., Putnam, P., & Haynes, O. M. (1993). Stability of emotion experiences and their relations to traits of personality. *Journal of Personality and Social Psychology*, *64*, 847–860. doi: 10.1037/0022-3514.64.5.847
- Jang, S., Kim, E. S., Cao, C., Allen, T. D., Cooper, C. L., Lapierre, L. M., ... Woo, J.-M. (2017). Measurement invariance of The Satisfaction With Life Scale across 26 countries. *Journal of Cross-Cultural Psychology*, *48*, 560–576. doi: 10.1177/0022022117697844
- Jayawickreme, E., Tsukayama, E., & Kashdan, T. B. (2017). Examining the effect of affect on life satisfaction judgments: A within-person perspective. *Journal of Research in Personality*, *68*, 32–37. doi: 10.1016/j.jrp.2017.04.005
- Joshanloo, M. (2019). Cultural religiosity as the moderator of the relationship between affective experience and life satisfaction: A study in 147 countries. *Emotion*, *19*, 629–636. doi: 10.1037/emo0000469
- Jovanović, V. (2015). Beyond the PANAS: Incremental validity of the Scale of Positive and Negative Experience (SPANE) in relation to well-being. *Personality and Individual Differences*, *86*, 487–491. doi: 10.1016/j.paid.2015.07.015
- Kahneman, D., Krueger, A. B., Schkade, D. A., Schwarz, N., & Stone, A. A. (2004). A survey method for characterizing daily life experience: The Day Reconstruction Method. *Science*, *306*, 1776–1780.
- Kapteyn, A., Lee, J., Tassot, C., Vonkova, H., & Zamarro, G. (2015). Dimensions of subjective well-being. *Social Indicators Research*, *123*, 625–660. doi: 10.1007/s11205-014-0753-0

- Kashdan, T. B., Biswas-Diener, R., & King, L. (2008). Reconsidering happiness: The costs of distinguishing between hedonics and eudaimonia. *Journal of Positive Psychology, 3*, 219–233. doi: 10.1080/17439760802303044
- Keyes, C. L. M., Shmotkin, D., & Ryff, C. D. (2002). Optimizing well-being: The empirical encounter of two traditions. *Journal of Personality and Social Psychology, 82*, 1007–1022. doi: 10.1037/0022-3514.82.6.1007
- Killen, A., & Macaskill, A. (2015). Using a gratitude intervention to enhance well-being in older adults. *Journal of Happiness Studies, 16*, 947–964. doi: 10.1007/s10902-014-9542-3
- Kilpatrick, F. P., & Cantril, H. (1960). Self-anchoring scaling: A measure of individuals' unique reality worlds. *Journal of Individual Psychology, 16*, 158–173.
- Kim-Prieto, C., Diener, E., Tamir, M., Scollon, C. N., & Diener, M. (2005). Integrating the diverse definitions of happiness: A time-sequential framework of subjective well-being. *Journal of Happiness Studies, 6*, 261–300.
- Kormi-Nouri, R., Farahani, M.-N., & Trost, K. (2013). The role of positive and negative affect on well-being amongst Swedish and Iranian university students. *Journal of Positive Psychology, 8*, 435–443. doi: 10.1080/17439760.2013.823511
- Kyriazos, T. A., Stalikas, A., Prassa, K., & Yotsidi, V. (2018). A 3-Faced Construct Validation and a Bifactor Subjective Well-Being Model Using the Scale of Positive and Negative Experience, Greek Version. *Psychology, 09*, 1143–1175. doi: 10.4236/psych.2018.95071
- Lam, J. A., & Kahler, C. W. (2018). A randomized crossover trial to test the effects of positive psychology intervention delivered by text messaging. *Journal of Positive Psychology, 13*, 393–405. Retrieved from eoah.

- Lambert, L., Passmore, H.-A., & Joshanloo, M. (2019). A positive psychology intervention program in a culturally-diverse university: Boosting happiness and reducing fear. *Journal of Happiness Studies*, *20*, 1141–1162. doi: 10.1007/s10902-018-9993-z
- Laurent, J., Catanzaro, S. J., Joiner, T. E. Jr., Rudolph, K. D., Potter, K. I., Lambert, S., ... Gathright, T. (1999). A measure of positive and negative affect for children: Scale development and preliminary validation. *Psychological Assessment*, *11*, 326–338. doi: 10.1037/1040-3590.11.3.326
- Lee, S. T. H., Hartanto, A., Yong, J. C., Koh, B., & Leung, A. K. -y. (2019). Examining the cross-cultural validity of the Positive Affect and Negative Affect Schedule between an Asian (Singaporean) sample and a Western (American) sample. *Asian Journal of Social Psychology*. doi: 10.1111/ajsp.12390
- Levin, K. A., & Currie, C. (2014). Reliability and validity of an adapted version of the Cantril Ladder for use with adolescent samples. *Social Indicators Research*, *119*, 1047–1063. doi: 10.1007/s11205-013-0507-4
- Li, F., Bai, X., & Wang, Y. (2013). The Scale of Positive and Negative Experience (SPANE): Psychometric Properties and Normative Data in a Large Chinese Sample. *PLoS ONE*, *8*, 1–9.
- Lim, Y.-J., Yu, B.-H., Kim, D.-K., & Kim, J.-H. (2010). The Positive and Negative Affect Schedule: Psychometric Properties of the Korean Version. *Psychiatry Investigation*, *7*, 163. doi: 10.4306/pi.2010.7.3.163
- Lucas, R. E., Wallsworth, C., Anusic, I., & Donnellan, M. B. (2020). A direct comparison of the day reconstruction method (DRM) and the experience sampling method (ESM). *Journal of Personality and Social Psychology*. doi: 10.1037/pspp0000289

- Luhmann, M., Hawkley, L. C., Eid, M., & Cacioppo, J. T. (2012). Time frames and the distinction between affective and cognitive well-being. *Journal of Research in Personality, 46*, 431–441. doi: 10.1016/j.jrp.2012.04.004
- Matthews, G., Jones, D. M., & Chamberlain, A. G. (1990). Refining the measurement of mood: The UWIST Mood Adjective Checklist. *British Journal of Psychology, 81*, 17–42. doi: 10.1111/j.2044-8295.1990.tb02343.x
- Mayer, J. D., & Gaschke, Y. N. (1988). The experience and meta-experience of mood. *Journal of Personality and Social Psychology, 55*, 102–111. doi: 10.1037/0022-3514.55.1.102
- Merz, E. L., & Roesch, S. C. (2011). Modeling trait and state variation using multilevel factor analysis with PANAS daily diary data. *Journal of Research in Personality, 45*, 2–9. doi: 10.1016/j.jrp.2010.11.003
- Michalos, A. C. (1985). Multiple discrepancies theory (MDT). *Social Indicators Research, 16*, 347–413. doi: 10.1007/BF00333288
- Oishi, S. (2018). Culture and subjective well-being: Conceptual and measurement issues. In E. Diener, S. Oishi, & L. Tay (Eds.), *Handbook of well-being*. Salt Lake City, UT: DEF. doi: nobascholar.com.
- Pavot, W. (2008). The assessment of subjective well-being: Successes and shortfalls. In M. Eid & R. J. Larsen (Eds.), *The science of subjective well-being*. (pp. 124–140). New York, NY: Guilford Press. (2008-00541-007).
- Pavot, W., Diener, E., & Suh, E. M. (1998). The Temporal Satisfaction With Life Scale. *Journal of Personality Assessment, 70*, 340–354. doi: 10.1207/s15327752jpa7002_11

- Rahm, T., Heise, E., & Schuldt, M. (2017). Measuring the frequency of emotions: Validation of the Scale of Positive and Negative Experience (SPANE) in Germany. *PLoS ONE*, *12*. (2017-06355-001).
- Schimmack, U., & Oishi, S. (2005). The influence of chronically and temporarily accessible information on life satisfaction judgments. *Journal of Personality and Social Psychology*, *89*, 395–406.
- Schneider, L., & Schimmack, U. (2009). Self-informant agreement in well-being ratings: A meta-analysis. *Social Indicators Research*, *94*, 363–376. doi: 10.1007/s11205-009-9440-y
- Schwarz, N., & Strack, F. (1999). Reports of subjective well-being: Judgmental processes and their methodological implications. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 61–84). New York, NY: Russell Sage Foundation.
- Scollon, C. N., Howard, A. H., Caldwell, A. E., & Ito, S. (2009). The role of ideal affect in the experience and memory of emotions. *Journal of Happiness Studies*, *10*, 257–269. doi: 10.1007/s10902-007-9079-9
- Scollon, C. N., Kim-Prieto, C., & Diener, E. (2003). Experience Sampling: Promises and pitfalls, strengths and weaknesses. *Journal of Happiness Studies*, *4*, 5–34. doi: 10.1023/A:1023605205115
- Shapira, N., Barak, A., & Gal, I. (2007). Promoting older adults' well-being through Internet training and use. *Aging & Mental Health*, *11*, 477–484. doi: 10.1080/13607860601086546

- Steger, M. F., Frazier, P., Oishi, S., & Kaler, M. (2006). The meaning in life questionnaire: Assessing the presence of and search for meaning in life. *Journal of Counseling Psychology, 53*, 80–93. doi: 10.1037/0022-0167.53.1.80
- Suh, E. M., Diener, E., Oishi, S., & Triandis, H. C. (1998). The shifting basis of life satisfaction judgments across cultures: Emotions versus norms. *Journal of Personality and Social Psychology, 74*, 482–493.
- Sumi, K. (2014a). Reliability and validity of Japanese versions of the Flourishing Scale and the Scale of Positive and Negative Experience. *Social Indicators Research, 118*, 601–615. doi: 10.1007/s11205-013-0432-6
- Sumi, K. (2014b). Temporal Stability of the Japanese Versions of the Flourishing Scale and the Scale of Positive and Negative Experience. *Journal of Psychology & Psychotherapy, 04*. doi: 10.4172/2161-0487.1000140
- Tay, L., & Diener, E. (2011). Needs and subjective well-being around the world. *Journal of Personality and Social Psychology, 101*, 354–365. doi: 10.1037/a0023779
- Terraciano, A., McCrae, R. R., & Costa, P. T. Jr. (2003). Factorial and construct validity of the Italian Positive and Negative Affect Schedule (PANAS). *European Journal of Psychological Assessment, 19*, 131–141. doi: 10.1027//1015-5759.19.2.131
- Thompson, E. R. (2007). Development and validation of an internationally reliable short-form of the Positive and Negative Affect Schedule (PANAS). *Journal of Cross-Cultural Psychology, 38*, 227–242. doi: 10.1177/0022022106297301
- Tov, W. (2012). Daily experiences and well-being: Do memories of events matter? *Cognition & Emotion, 26*, 1371–1389. doi: 10.1080/02699931.2012.660135

- Tov, W. (2018). Well-being concepts and components. In E. Diener, S. Oishi, & L. Tay (Eds.), *Handbook of subjective well-being* (pp. 1–15). Salt Lake City, UT: DEF. doi: nobascholar.com.
- Tov, W., & Au, E. W. M. (2013). Comparing well-being across nations: Conceptual and empirical issues. In S. A. David, I. Boniwell, & A. Conley Ayers (Eds.), *The Oxford handbook of happiness*. (pp. 449–464). New York, NY: Oxford University Press.
- Tov, W., & Lee, H. W. (2016). A closer look at the hedonics of everyday meaning and satisfaction. *Journal of Personality and Social Psychology*, *111*, 585–609. doi: 10.1037/pspp0000081
- Tov, W., & Nai, Z. L. S. (2018). Cultural differences in subjective well-being: How and why. In J. E. Maddux (Ed.), *Subjective well-being and life satisfaction*. (pp. 50–73). New York, NY: Routledge. psych (2017-47527-003).
- Tsai, J. L., Knutson, B., & Fung, H. H. (2006). Cultural variation in affect valuation. *Journal of Personality and Social Psychology*, *90*, 288–307. doi: 10.1037/0022-3514.90.2.288
- Vittersø, J. (Ed.). (2016). *Handbook of eudaimonic well-being*. doi: 10.1007/978-3-319-42445-3
- Vittersø, J., Røysamb, E., & Diener, E. (2002). The concept of life satisfaction across cultures: Exploring its diverse meaning and relation to economic wealth. In E. Gullone & R. A. Cummins (Eds.), *The universality of subjective wellbeing indicators: A multi-disciplinary and multi-national perspective* (pp. 81–103). Dordrecht, Netherlands: Kluwer Academic.
- Watson, D., & Clark, L. A. (1994). *The PANAS-X: Manual for the Positive and Negative Affect Schedule—Expanded Form*. Des Moines, IA: University of Iowa.

- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*, 1063–1070.
- Weber, M., Harzer, C., Huebner, E. S., & Hills, K. J. (2015). Measures of life satisfaction across the lifespan. In G. J. Boyle, D. H. Saklofske, & G. Matthews (Eds.), *Measures of personality and social psychological constructs* (pp. 101–130). doi: 10.1016/B978-0-12-386915-9.00005-X
- Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review, 92*, 548–573. doi: 10.1037/0033-295X.92.4.548
- Woodworth, R. J., O'Brien-Malone, A., Diamond, M. R., & Schütz, B. (2016). Happy Days: Positive Psychology interventions effects on affect in an N-of-1 trial. *International Journal of Clinical and Health Psychology, 16*, 21–29. doi: 10.1016/j.ijchp.2015.07.006
- Yap, S. C. Y., Wortman, J., Anusic, I., Baker, S. G., Scherer, L. D., Donnellan, M. B., & Lucas, R. E. (2017). The effect of mood on judgments of subjective well-being: Nine tests of the judgment model. *Journal of Personality and Social Psychology, 113*, 939–961. doi: 10.1037/pspp0000115
- Zhang, J., Yang, Y., & Wang, H. (2009). Measuring subjective well-being: A comparison of China and the USA. *Asian Journal of Social Psychology, 12*, 221–225.

Table 1

Meta-Analytic Correlations among Measures of Subjective Well-Being^a

Measure	1	2	3	4	5	6	7
1. LADDER	--	5 (762)	3 (358)	3 (358)	4 (539)	4 (539)	4 (539)
2. SWLS	.68	--	7 (1316)	7 (1316)	15 (28508)	15 (28508)	12 (26731)
3. PANAS-PA	.53	.46	--	9 (1840)	9 (2159)	9 (2159)	7 (1351)
4. PANAS-NA	-.42	-.39	-.35	--	9 (2159)	9 (2159)	7 (1351)
5. SPANE-P	.63	.59	.61	-.48	--	22 (31519)	18 (29595)
6. SPANE-N	-.50	-.43	-.45	.71	-.57	--	18 (29595)
7. SPANE-B	.63	.58	.57	-.65	.87	-.89	--

Note. LADDER = Cantril's Ladder (Self-Anchoring Striving Scale); SWLS = Satisfaction with Life Scale; PANAS = Positive Affect and Negative Affect Schedule; PA = Positive Affect; NA = Negative Affect; SPANE = Scale of Positive and Negative Experiences; P = Positive Feelings; N = Negative Feelings; B = Affect Balance. These analyses consists only of studies that specified a time frame of the *past month* or *past four weeks* for PANAS and SPANE. Meta-analytic correlations appear below the diagonal. Number of studies (total number of individuals) contributing to each correlation appear above the diagonal. All correlations were statistically significant at $p < .05$.

^a 95% confidence intervals are reported in the online supplement.

Table 2

Satisfaction with Life Scale (SWLS) Alpha Reliabilities

Group	<i>N</i>	<i>k</i>	alpha	95% CI
<u>Language</u>				
Arabic	193	1	.74	--
Bulgarian	286	1	.60	--
Cantonese	931	1	.79	--
Chinese	2566	12	.85	[.82; .88]
Dutch	7295	4	.84	[.81; .87]
English	72463	50	.87	[.86; .89]
Estonian	249	1	.86	--
Finnish	259	1	.88	--
French	638	1	.91	--
German	684	2	.85	[.82; .88]
Greek	4318	3	.87	[.84; .90]
Japanese	841	2	.86	[.82; .90]
Korean	625	3	.87	[.82; .91]
Polish	261	1	.86	--
Romanian	271	1	.88	--
Serbian	1777	3	.85	[.80; .90]
Slovene	306	1	.89	--
Spanish	2057	7	.87	[.84; .89]
Turkish	1134	3	.84	[.80; .88]
Ukrainian	228	1	.88	--
<u>Age</u>				
Under 18	676	4	.85	[.82; .89]
18 to 25	9725	37	.85	[.83; .86]
26 to 65	80588	48	.87	[.86; .88]
Over 65	257	2	.93	[.84; .98]

Note. *N* = number of individuals; *k* = number of studies; CI = confidence interval.

Table 3

Positive Affect and Negative Affect Schedule (PANAS) Alpha Reliabilities

Group	PANAS-PA				PANAS-NA			
	<i>N</i>	<i>k</i>	alpha	95% CI	<i>N</i>	<i>k</i>	alpha	95% CI
<u>Language</u>								
Arabic	193	1	.80	--	193	1	.81	--
Chinese	694	3	.81	[.80; .82]	1097	4	.85	[.81; .89]
Dutch	4074	4	.86	[.85; .88]	4074	4	.87	[.82; .91]
English	9175	38	.86	[.85; .88]	8665	38	.85	[.83; .87]
German	684	2	.85	[.82; .88]	684	2	.82	[.79; .85]
Hindi	179	1	.80	--	179	1	.78	--
Italian	945	2	.87	[.78; .94]	945	2	.88	[.82; .92]
Korean	587	3	.83	[.78; .88]	587	3	.87	[.81; .91]
Persian	300	1	.88	--	300	1	.86	--
Portuguese	1291	1	.92	--	5019	2	.88	[.86; .89]
Serbian	808	2	.82	[.76; .88]	808	2	.82	[.74; .88]
Spanish	3336	4	.86	[.82; .90]	3336	4	.82	[.68; .92]
<u>Time Frame</u>								
General	10670	20	.84	[.82; .86]	13834	18	.84	[.82; .86]
Past month	5248	21	.84	[.82; .86]	5248	21	.82	[.80; .84]
Past few weeks	498	1	.86	--	498	1	.83	--
Past week	3544	9	.88	[.86; .89]	3544	9	.87	[.86; .89]
Past few days	138	1	.90	--	138	1	.89	--
Past day	276	1	.92	--	276	1	.91	--
Present moment	1480	7	.88	[.84; .91]	1480	7	.86	[.78; .91]
Recalled event	190	1	.87	--	--	--	--	--
Unknown ^a	876	3	.91	[.90; .91]	869	6	.90	[.85; .93]
<u>Age</u>								
Under 18	3137	7	.80	[.77; .83]	3137	7	.80	[.78; .82]
18 to 25	6020	28	.86	[.84; .87]	5176	25	.84	[.81; .86]
26 to 65	6839	16	.88	[.86; .90]	10650	19	.88	[.86; .90]
Over 65	1923	3	.89	[.84; .92]	1923	3	.86	[.82; .89]

Note. *N* = number of individuals; *k* = number of studies; CI = confidence interval; PANAS-PA = Positive Affect; PANAS-NA = Negative Affect.

^a Time frame was not reported in the article.

Table 4

Scale of Positive and Negative Experiences (SPANE) Alpha Reliabilities

Group	<i>N</i>	<i>k</i>	SPANE-P		SPANE-N		SPANE-B			
			alpha	95% CI	alpha	95% CI	<i>N</i>	<i>k</i>	alpha	95% CI
<u>Language</u>										
Cantonese ^a	931	1	.82	--	.81	--	931	1	.85	--
Chinese	22092	3	.88	[.81; .93]	.86	[.77; .93]	21322	1	.92	--
Dutch	--	--	--	--	--	--	226	1	.81	--
English	4835	16	.88	[.85; .90]	.81	[.78; .84]	4505	13	.84	[.78; .88]
German	719	3	.88	[.87; .88]	.83	[.79; .86]	719	3	.90	[.89; .91]
Greek	2272	1	.90	--	.85	--	2272	1	.91	--
Hebrew	211	2	.82	[.74; .89]	.79	[.75; .82]	--	--	--	--
Italian	1737	6	.90	[.89; .92]	.86	[.82; .90]	1737	6	.92	[.91; .92]
Japanese	856	2	.91	[.90; .91]	.89	[.85; .91]	856	2	.88	[.87; .88]
Persian	296	1	.42	--	.07	--	--	--	--	--
Portuguese ^b	911	2	.90	[.89; .91]	.84	--	911	2	.88	[.88; .88]
Serbian	1777	3	.90	[.88; .92]	.84	[.79; .88]	--	--	--	--
Spanish	489	1	.92	--	.83	--	170	1	.89	--
Swedish	310	1	.34	--	.59	--	--	--	--	--
Turkish	1273	3	.87	[.82; .91]	.81	[.72; .88]	--	--	--	--
<u>Time Frame</u>										
Past 4 weeks	34041	31	.89	[.87; .90]	.84	[.82; .85]	31851	26	.89	[.87; .90]
Past 3 weeks	191	1	.93	--	.91	--	--	--	--	--
Past 2 weeks	147	1	.80	--	.78	--	--	--	--	--
Unknown ^c	4444	13	.83	[.75; .90]	.78	[.69; .84]	2062	7	.78	[.65; .88]
<u>Age</u>										
Under 18	1392	3	.87	[.79; .93]	.79	[.75; .84]	837	3	.84	[.77; .89]

Group	<i>N</i>	<i>k</i>	SPANE-P		SPANE-N		SPANE-B			
			alpha	95% CI	alpha	95% CI	<i>N</i>	<i>k</i>	alpha	95% CI
18 to 25	7128	21	.85	[.80; .89]	.81	[.75; .85]	4603	13	.88	[.86; .89]
26 to 65	29624	18	.89	[.86; .90]	.85	[.82; .87]	27907	13	.88	[.83; .92]
Over 65	88	1	.96	--	.81	--	--	--	--	--

Note. *N* = number of individuals; *k* = number of studies; CI = confidence interval; SPANE-P = Positive Feelings; SPANE-N = Negative Feelings; SPANE-B = Affect Balance (full scale with negative experience items reverse scored). For SPANE-PA and SPANE-N, *N*'s and *k*'s were identical.

^a Refers to spoken language because items were administered by telephone survey

^b 95% CI's could not be computed for SPANE-N due to a lack of variation in alphas in the meta-analysis.

^c Time frame was not reported in the article.