

Valid Assessment of Spiritual Quality of Life with the WHOQOL-SRPB BREF across
Religious, Spiritual, and Secular Persons: A Psychometric Study

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Abstract

Spiritual well-being is increasingly recognized as a distinctive, important, and cross-cultural concept in quality of life assessment. The Spiritual Quality of Life-9 subscale (SQOL-9) of the World Health Organization's Quality of Life Spirituality, Religiousness, and Personal Beliefs brief instrument (WHOQOL-SRPB BREF) was designed to facilitate cross-cultural assessment of SQOL among people who are neither religious nor spiritual (NRS), spiritual but not religious (SNR), and religious and spiritual (RS). The present study ($N = 2003$ adults) sought to examine the SQOL-9 factor structure, measurement equivalence/invariance, degree of redundancy with positive religious coping, and relationship with well-being (e.g., meaning in life, satisfaction with life, physical health, and mental health) across these three groups. Results suggested that the SQOL-9 is defined by two factors. The first factor ("spiritual coping QOL") lacked metric invariance between the NRS and RS, suggesting that the meaning of this factor differs for these two groups. It also showed evidence of empirical redundancy with positive religious coping among the RS. This factor was either inversely related, or unrelated, to well-being within each group, suggesting it may function as a proxy for stress when the second factor ("existential QOL") is accounted for. However, the existential QOL factor was robustly associated with well-being for all groups. Invariance results indicated this factor had a similar conceptual meaning across the three groups, but the observed mean scores are not always directly comparable. In summary, the SQOL-9 demonstrated important strengths and limitations for the assessment of SQOL across diverse worldviews.

Keywords: spiritual quality of life; spiritual well-being; validity; factor analysis; measurement invariance

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Measuring spirituality is notoriously difficult, given its contested definition, complex relationship with religiousness, and cross-cultural and cross-denominational variation (Hill & Pargament, 2003). Social scientists have made numerous attempts to develop instruments that can measure spirituality in a valid and fair manner regardless of respondents' worldview (e.g., Cragun, Hammer, Nielsen, 2015). Scholars have long recognized that spirituality is better conceptualized as a multidimensional construct and sought to develop measures to assess each dimension, such as daily spiritual experiences (Underwood & Teresi, 2002), spiritual struggles (Exline, Pargament, Grubbs, & Yali, 2014), and spiritual well-being (Ellison, 1983).

Spiritual well-being is increasingly recognized as a distinctive, important, and cross-cultural concept in quality of life assessment (Skevington, Gunson, & O'Connell, 2013). The World Health Organization Quality of Life Spirituality, Religiousness, and Personal Beliefs (WHOQOL-SRPB) instrument was designed to facilitate cross-cultural assessment of spiritual quality of life (SQOL) among people with diverse religious, spiritual, and secular personal beliefs (WHOQOL SPRB Group, 2006). International expert review, 92 focus groups in 15 countries, and exploratory factor analysis ($N = 2334$) produced subscales measuring eight SQOL facets: connectedness to a spiritual being or force, meaning of life, awe, wholeness and integration, spiritual strength, inner peace/serenity/harmony, hope and optimism, and faith. The WHO defined SQOL as individuals' perceptions of their existential well-being in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns.

To create a short form for widespread use in global quality of life research, Skevington and colleagues (2013) developed a nine-item SQOL subscale (SQOL-9) consisting of one item from each of the eight WHOQOL-SRPB facets plus a ninth item from the single spiritual facet of the original WHOQOL-100. The SQOL-9 is one subscale of the WHOQOL-SRPB BREF battery that measures various types of quality of life. The developers stated that the SQOL-9 is reliable and valid, can assess almost every type of person, and that the construct validity of the SQOL-9 is tentative until tested cross-culturally.

O'Connell and Skevington (2005) conducted focus groups with religious and spiritual (RS), spiritual but not religious (SNR), and neither religious nor spiritual (NRS) British adults to explore whether certain facets of SQOL are valid across worldviews. SNR and NRS participants pointed out the irrelevance and lack of conceptual clarity of concepts measured by certain SQOL-9 items, such as life having an innate purpose, feeling connected to a spiritual being, wholeness and integration, and faith giving comfort. The authors noted that the lack of universal applicability of these concepts to people across the religious-secular spectrum has serious implications for measurement.

Specifically, it is inappropriate to use the SQOL-9 to examine differences in SQOL or compare the association between SQOL and other constructs unless the SQOL-9 has demonstrated measurement equivalence/invariance (ME/I) across NRS, SNR, and RS persons. ME/I ensures that the SQOL-9 has the same theoretical structure and meaning for each group (Cheung & Lau, 2012). Without ME/I, an unknown proportion of any observed intergroup difference could be because of differences in measurement, rather than true differences in the degree of SQOL. Given that the SQOL-9 is explicitly marketed as the preferred instrument for cross-worldview SQOL research (Skevington et al., 2013), and is already being used to compare

SQOL across worldview groups (e.g., Akrawi et al., 2017), it is important to provide evidence that the instrument measures the same factors across NRS, SNR, and RS samples.

Factor Structure

Using a United Kingdom community sample, Skevington and colleagues (2013) conducted maximum likelihood extraction factor analysis with orthogonal rotation to argue for the retention of two factors: “religious beliefs” (4 items: spiritual connection, faith, spiritual strength, wholeness) and “existential concerns” (3 items: hope, inner peace, purpose). The awe and meaning items failed to load simply on either factor. However, the developers also appeared to describe the SQOL-9 as measuring a single SQOL domain (see p. 1081), which is typically operationalized via a unidimensional model. Using a New Zealand college student sample, Krägeloh, Billington, Henning, and Chai (2015) provided confirmatory factor analysis evidence that the SQOL-9 is defined by two factors: “spiritual coping” (3 items: spiritual connection, faith, spiritual strength) and “spiritual quality of life” (6 items: wholeness, hope, inner peace, purpose, awe, meaning). However, they did not separate the sample into those who are NRS, SNR, and RS. To avoid confusion between the two subscales identified by Krägeloh et al. (2015), we will refer to their first factor as spiritual coping QOL and their second factor as existential QOL throughout this manuscript. In summary, at least three competing factor models for the SQOL-9 have been suggested in the literature: a unidimensional model, a seven-item two correlated factors model, and a nine-item two correlated factors model. Therefore, the present study used confirmatory factor analysis to determine which of these three factor structures provided an adequate fit within NRS, SNR, and RS samples. Next, ME/I analysis was used to confirm that the preferred model for the SQOL-9 measures the same constructs across the three groups.

SQOL or Coping

Beyond issues of equivalence, Krägeloh, Billington, Henning, and Chai (2015) provided empirical evidence that the spiritual coping QOL factor was highly correlated with a measure of religious coping, suggesting that these three items are better characterized as measures of coping than SQOL among New Zealand university students. However, the percentage of NRS, SNR, and RS persons within their sample was not reported and thus it is uncertain whether this finding only applies to a specific worldview group or not. To address this limitation, the present study examined the degree of empirical overlap between the spiritual coping QOL factor and a measure of positive religious coping for each of the three groups. We used Brown's (2015) criteria of $r > .80$ (see p. 28) as the threshold above which two latent factors can be considered to be measuring extremely similar, rather than independent, constructs. If the spiritual coping QOL factor was found to be empirically redundant with a positive religious coping factor, this would raise questions about the conceptual independence of this facet of SQOL.

SQOL's Relationship with Well-Being

Implicit in the concept of SQOL is that having stronger SQOL is healthy for everyone. In fact, O'Connell and Skevington (2010) note that "growing research on spiritual health has led the World Health Assembly (1998) to consider incorporating spiritual well-being into the WHO definition of health" (p. 729). However, most of this research has used samples predominantly composed of RS persons, for whom spiritual concepts are relevant to their worldview. Thus, it is less clear if SQOL is synonymous with well-being among NRS persons, especially SQOL aspects (e.g., faith) captured by the spiritual coping QOL factor. For example, for someone who does not believe in the existence of a higher power, faith may be irrelevant to providing comfort in daily life. Given that past research has documented that certain spirituality constructs (e.g., daily spiritual experiences; Hammer & Cragun, in press) were not associated with enhanced

well-being among NRS and SNR persons, we sought to determine if this was the case with SQOL. If SQOL's relationship with well-being was found to be dependent on group membership, this would caution researchers and practitioners against conceptualizing SQOL, by definition, as healthy for all humans. Given the building momentum surrounding efforts to increase the incorporation of SQOL interventions in healthcare settings (Isaac, Hay, & Lubetkin, 2016; Thompson et al., 2016), this question is important to resolve, lest healthcare professionals risk alienating secular persons with such spiritual interventions.

Present Study

The present study sought to (a) identify the most appropriate factor structure for the SQOL-9 within samples of NRS, SNR, and RS persons, (b) examine the ME/I of the SQOL-9 factor(s) across the three groups, (c) determine the degree of empirical overlap between the spiritual coping QOL factor and a positive religious coping factor, and (d) investigate the relationship between the SQOL-9 factor(s) and common measures of well-being (e.g., meaning in life, satisfaction with life, physical health, and mental health).

Because the preponderance of factor analysis evidence seems to support a two-factor model for the SQOL-9, we hypothesized (H1) that Krägeloh and colleagues' (2015) two correlated factors would best account for the SQOL-9's item variance. Given that the SQOL-9 was developed specifically for cross-cultural research with religious, spiritual, and secular people alike (Skevington et al., 2013), we hypothesized (H2) that the SQOL-9 would demonstrate strong ME/I (Dimitrov, 2010). Strong ME/I is concluded when configural (i.e., model fits adequately in each group), metric (i.e., the 9 items load on the SQOL-9's factor(s) to a similar degree in each group), and scalar (i.e., the 9 item intercepts have similar magnitude in each group) invariance are present. Given that Krägeloh and colleagues (2015) provided initial evidence of high

correlation between the spiritual coping QOL and a measure of religious coping, we hypothesized (H3) that the two latent factors would be empirically redundant (i.e., $r > .80$). Lastly, given the common framing of SQOL as healthy for all humans, we hypothesized (H4) that the SQOL-9's factor(s) would demonstrate a positive relationship with well-being factors among all three groups.

Method

Participants and Procedure

Participants were 2003 adults recruited from two sources. The majority of participants ($N = 1599$) were initially recruited via ResearchMatch, a national health volunteer registry created by several academic institutions and supported by the U.S. National Institutes of Health as part of the Clinical Translational Science Award (CTSA) program. ResearchMatch has a large population of volunteers who have consented to be contacted by researchers about health studies for which they may be eligible. Review and approval for this study and all procedures was obtained from the University of Kentucky Office of Research Integrity. Participants were contacted via the registry system regarding the study, which was advertised as a survey about measuring spirituality across diverse groups of people. Participants were also recruited via websites (e.g., www.atheistresearch.org), listservs (e.g., Nonreligion and Secularity Research Network listserv), and social media platforms (e.g., Atheist Research Collaborative Facebook Page and Twitter Account) related to (non)religion. Interested participants were directed to an online survey that began with an informed consent page, followed by the instrument battery and demographic items, and ended with a conclusion page. Participants had the option of entering a drawing for one of several \$25 Amazon.com gift cards. Data from these participants was previously used by Hammer and Cragun (in press) to examine the psychometric properties of the

Daily Spiritual Experiences Scale (Underwood & Teresi, 2002) across the three worldview groups. Because this group of ResearchMatch participants had a mean age of 46.50, we sought to increase the number of younger persons in the sample used in the present study. Thus, we recruited additional participants ($N = 404$) from the subject pool of a Midwestern university psychology department to complete this survey in exchange for class credit in their psychology or communication studies course.

Participants (667 men, 1314 women, and 19 individuals who self-identified with a different gender identity label) ranged in age from 18 to 88 years old ($M = 41.01$, $Median = 36$, $SD = 18.39$). Approximately 84% of the sample identified as White, 4% as African American/Black, 3% as Latino/a, 2% multiracial, 2% Asian American or Pacific Islander, and 3% as another racial/ethnic identity. Of those recruited from ResearchMatch, approximately 0.2% reported having less than a high school education, 3% earned a high school diploma or GED, 7% earned a two-year degree, 14% had some college experience, 30% earned a four-year college degree, 45% earned a graduate or professional degree, and 0.1% preferred not to answer. Of those recruited from the subject pool, 48% were first year students, 25% were sophomores, 17% were juniors, 9% were seniors, and 0.7% were in another year. When asked “What label best describes how you generally identify yourself when asked what your religion or belief system is?”, participants responded as follows: 21% Atheist, 14% Agnostic, 12% Roman Catholic, 12% Christian unspecified, 8% non-denominational Christian, 4% Protestant unspecified, 3% United Methodist, 2% Jewish, 2% Southern Baptist, 2% Buddhist, 1% Episcopalian, 1% The Church of Jesus Christ of Latter-day Saints, 0.5% New Age, 0.5% Muslim, 0.3% Orthodox Christian, 0.1% Hindu, 0.1% American Indian or Native American Religion, and 17% opted to provide their own label. The five most common labels provided

were Unitarian Universalist ($n = 36$), Humanist ($n = 28$), Lutheran ($n = 16$), Spiritual / spiritual but not religious ($n = 15$), and None ($n = 12$).

Measures

Spiritual Quality of Life. The nine-item SQOL-9 (Skevington et al., 2013) was designed to measure SQOL. Responses are rated on a five-point Likert-type scale from 1 (*not at all*) to 5 (*completely*), with higher scores indicating greater SQOL. The SQOL-9 has demonstrated internal structure and convergent evidence of validity and internal consistency ($\alpha > .83$; Skevington et al., 2013).

Positive Religious Coping. The seven-item positive coping subscale of the Brief RCOPE (Pargament, Feuille, & Burdzy, 2011) was used to measure positive religious coping. Responses are rated on a four-point Likert-type scale from 1 (*not at all*) to 4 (*a great deal*), with a higher mean score indicating greater use of positive religious coping. The subscale has demonstrated convergent and discriminant evidence of validity and internal consistency (*Median* $\alpha = .92$; Pargament et al., 2011). The present study's internal consistency estimates for the NRS, SNR, and RS were .95, .93, .91, respectively.

Meaning in Life. The five-item presence subscale of the Meaning in Life Questionnaire (MLQ; Steger, Frazier, Oishi, & Kaler, 2006) was used to measure felt meaning in life. Responses are rated on a seven-point Likert-type scale from 1 (*absolutely untrue*) to 7 (*absolutely true*), with a higher mean score indicating greater meaning. The MLQ has demonstrated convergent and discriminant evidence of validity and internal consistency ($\alpha > .82$; Steger et al., 2006). The present study's internal consistency estimates for the NRS, SNR, and RS were .89, .89, and .90, respectively.

Satisfaction with Life. The Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) is a five-item instrument designed to measure cognitive self-evaluation of global life satisfaction. Responses are rated on a seven-point Likert-type scale from 1 (*strongly disagree*) to 7 (*strongly agree*), with higher scores representing higher life satisfaction. The SWLS has demonstrated convergent and predictive evidence of validity and internal consistency ($\alpha > .79$; Pavot & Diener, 2008). The present study's internal consistency estimates for the NRS, SNR, and RS were .90, .89, and .88, respectively.

Physical and Mental Health. The four-item global physical health subscale and the 4-item global mental health subscale derived from the 10 global health items of the National Institute of Health's Patient-Reported Outcome Measurement Information System (PROMIS; Hays, Bjorner, Revicki, Spritzer, & Cella, 2009) were used to measure physical and mental health, respectively. Responses are rated on a five-point Likert-type scale from 1 (e.g., *poor*) to 5 (e.g., *excellent*), with a higher mean score indicating better health. These subscales have demonstrated convergent evidence of validity and internal consistency ($\alpha > .81$; Hays et al., 2009). The present study's physical health internal consistency estimates for the NRS, SNR, and RS were .74, .73, and .77, respectively. The mental health estimates for the NRS, SNR, and RS were .81, .82, and .80, respectively.

Religiousness and Spirituality. The two Overall Self-Ranking items from the Brief Multidimensional Measure of Religiousness/Spirituality (Abeles et al., 1999) were used to measure how religious (i.e., "To what extent do you consider yourself a religious person?") and spiritual ("To what extent do you consider yourself a spiritual person?") respondents considered themselves, using a 4-point Likert-type scale from "not at all" to "very."

Feedback. Participants were given the opportunity to provide free-response feedback about the SQOL-9 after completing it. Participants' anonymous feedback is provided verbatim in the Supplemental Material.

Analysis Plan and Data Cleaning

The initial dataset contained 2,341 individuals. Cases with more than one incorrect response to the three attention check items ($n = 70$) or with significant ($> 20\%$) item-level missingness on any given scale ($n = 235$) were deleted (Parent, 2013). Cases that did not answer both the “To what extent do you consider yourself a religious person?” and “To what extent do you consider yourself a spiritual person?” questions ($n = 33$) were also deleted, given that they could not accurately be sorted into one of the three groups to be analyzed. In the final sample ($N = 2003$), no variables exceeded the cutoffs of 3 and 10 for high univariate skewness and kurtosis values, respectively (Weston & Gore, 2006). We used the MLR estimator in *Mplus* version 6.11 (Muthén & Muthén, 1998-2012) to estimate the model χ^2 and associated fit indices that protect against deviations from multivariate normality. Missing data ranged from a low of 0% for many items to a high of 0.7% for one of the positive religious coping items. We used Full Information Maximum Likelihood (FIML) estimation in *Mplus* for all model analyses to handle missing data. To sort participants into the three worldview groups of interest, we followed the precedent of Streib and Hood (2016), Hammer and Cragun (in press), and Zinnbauer, Pargament, Cole, Rye, Butter, and Belavich (1997). First, the neither religious nor spiritual (NRS) group included 488 participants who indicated both “not religious at all” and “not spiritual at all” on the Religiousness and Spirituality items (see Measures section). Second, the spiritual but not religious (SNR) included 525 participants who indicated “not religious at all” and at least “slightly spiritual”. Third, the religious and spiritual (RS) group included 990 participants who

indicated at least “slightly religious” and “slightly spiritual”. We noted that 28 participants indicated “not spiritual at all” and at least “slightly religious” but the small cell size for this group precluded comparison with the other three groups. The Supplemental Material provides a breakdown of belief labels (e.g., atheist) by worldview group.

Factor Structure. We first compared the fit of three different confirmatory factor analysis measurement models (i.e., unidimensional, seven-item two correlated factors model, and a nine-item two correlated factors model) for the SQOL-9. The scaled chi-square statistic (scaled χ^2), Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and standardized root mean square residual (SRMR) were used to assess the goodness of fit for each model. The following fit criteria were used: RMSEA \leq .06, CFI \geq .95, TLI \geq .95, and SRMR \leq .08 for good fit and RMSEA \leq .10, CFI \geq .90, TLI \geq .90, and SRMR \leq .10 for acceptable fit (Hu and Bentler, 1999; Weston & Gore, 2006). Kline (2015) states that researchers must first find an acceptable measurement model before proceeding to test a structural model, because omission of theoretically defensible measurement model respecifications can lead to inaccurate structural model results. Thus, we planned to use modification indices to guide theoretically defensible respecification as needed, implementing respecifications one step at a time until an adequate measurement model was identified. Soper’s (2013) sample size calculator for structural equation models was used (effect size = .20, power = .80, alpha = .05, number of latent variables = 6, number of observed variables = 27) to calculate the minimum sample size needed for adequate power in the current study. The three worldview group subsamples (N’s = 488, 525, 990) each exceeded the sample required (N = 403) by the most complex model—the structural model used to test H4.

Measurement Invariance/Equivalence. We examined ME/I by using multiple-group CFA to compare a series of nested models, following the Sequential Constraint Imposition approach (Dimitrov, 2010). Given the limitations of using significant $\Delta\chi^2$ as an indicator of invariance (e.g., sensitivity to sample size), we used Chen's (2007) recommended cutoff for ME/I analyses using an adequate sample ($N > 300$): "For testing [metric] invariance, a change of $\geq -.01$ in CFI, supplemented by a change of $\geq .015$ in RMSEA or a change of $\geq .030$ in SRMR would indicate noninvariance... for testing [scalar] invariance, a change of $\geq -.01$ in CFI, supplemented by a change of $\geq .015$ in RMSEA or a change of $\geq .010$ in SRMR would indicate noninvariance" (p. 501). Thus, model parameters differ significantly across groups when the CFI and at least one of the other two fit indices (i.e., RMSEA or SRMR) exceed the cutoffs.

To test for configural invariance, a baseline measurement model was specified and tested for adequacy of data fit in each of the three groups separately. Assuming the baseline model fits for all three groups, the fit of the three multiple-group configural models comparing each group to the other (i.e., NRS vs. SNR, NRS vs. RS, and SNR vs. RS) was investigated. When configural invariance held, we then tested metric invariance by comparing fully invariant models in which each item loads on its corresponding factor to the same degree in the groups being compared with the previous nested multiple-group configural models. When metric invariance held, we then tested scalar invariance by comparing fully invariant models in which each item intercept is set to be equal across groups to the previous nested metric models. A factor can be fully invariant (i.e., 100% of items conform to the requirements of that level of invariance) or partially invariant (i.e., majority of items [51%-99% of items per group] conform to the requirements of that level of variance). In cases in which full metric or full scalar invariance was not supported, we used a direct model comparison approach using 99% bias corrected bootstrap

confidence intervals (Cheung & Lau, 2012) to determine if it would be possible to establish partial invariance at that level. The direct model comparison approach creates 1000 bootstrap samples and calculates the high and low confidence intervals for each parameter (e.g. differences across groups on factor loadings, intercepts). Parameters are shown to be invariant across groups when differences between the groups on those parameters are not statistically significant (i.e., zero falls within the confidence interval). Cheung & Lau suggest that partial metric and/or scalar invariance warrants further measurement invariance testing only when the “majority of items (i.e., more than half) [are] identified as invariant” (p. 178).

SQOL or Coping. We examined the latent correlation between the spiritual coping quality of life factor and a positive religious coping factor. We tested one CFA model per group. The SQOL-9 items were set to load on the latent factors specified by the retained CFA model, the positive religious coping items were set to load onto a positive religious coping latent factor, and the latent correlation between the SQOL-9 latent factors and the positive religious coping latent factor was examined to see if it fell above or below the $r = .80$ construct redundancy cutoff of Brown (2015).

SQOL’s Relationship with Well-Being. We examined the relationship between the SQOL-9 factors and common measures of well-being (i.e., meaning in life, satisfaction with life, physical health, and mental health). We tested one structural equation model per group. The SQOL-9 items were set to load on the factors specified by the retained CFA model, the well-being instruments’ items were set to load onto their respective well-being latent factors, and the four well-being factors were simultaneously regressed onto the SQOL-9 factors.

Results

Factor Structure

None of the models achieved adequate fit on all indices for all three groups (see Table 1 for all global model fit coefficients). Given that the awe and meaning items capture aspects of spiritual quality of life that were rated as important across all cultures (WHOQOL SPRB Group, 2006), we examined modification indices for the nine-item two correlated factors model to see which of the nine items may have been functioning as testlets (i.e., a set of items that share a common theme that leads the items to covary beyond the target construct). The largest modification index (NRS = 125.52, SNR = 72.54, RS = 126.13) across the three groups suggested specifying a correlated error between the meaning and purpose items, which are often treated as synonyms in the literature (Steger et al., 2006). This common item content provided a sound theoretical reason to respecify the measurement model with an error correlation between these two items. This modified nine-item two correlated factors model demonstrated adequate fit within each group and was therefore retained as the preferred model used to test the remaining hypotheses. As an aside, whereas the seven-item two correlated factors model had a better fit than the nine-item version and thus was tempting to use as a baseline model for exploring modification indices, examination of item residuals indicated that this better fit was being driven by the fact that dropping the awe and meaning items got rid of fit-reducing testlet relationships those items were involved in, rather than those items being inappropriate measures of SQOL (i.e., both items loaded $> .43$ across all three groups on the existential QOL factor). (To be thorough, we repeated all analyses using the seven-item version: our conclusions regarding H2, H3, and H4 remained consistent with what is reported below.)

It should be noted that the association between the two factors (NRS = $-.08$, $p = .19$; SNR = $.13$, $p = .01$; RS = $.49$, $p < .001$) varied markedly as a function of worldview group. The spiritual coping QOL (NRS = $.68$, SNR = $.89$, RS = $.90$) and existential QOL (NRS = $.81$, SNR =

.84, $RS = .84$) subscales demonstrated internal consistency, with one exception for the NRS (.68). In summary, Krägeloh and colleagues' (2015) modified nine-item two correlated factors model (with one correlated residual between the meaning and purpose items) was found to provide an adequate fit to the data for all three groups. This constituted partial support for H1.

Measurement Equivalence/Invariance

NRS vs SNR. The baseline measurement model (i.e., the modified nine-item two correlated factors model) demonstrated adequate fit in each group (discussed above), as did the three multiple-group configural models (see Table 2 for ME/I results). The full metric model demonstrated adequate fit that was similar to the fit of the configural model. However, the full scalar model demonstrated poorer fit than the full metric model. The bootstrapped confidence intervals suggested that all item intercepts for the spiritual coping QOL factor were significantly different between the NRS and SNR groups, suggesting the absence of partial scalar invariance. However, only one item intercept for the existential QOL factor was significantly different between the NRS and SNR groups, suggesting partial scalar invariance.

NRS vs. RS. The full metric model demonstrated adequate fit but was a poorer fit to the data than the configural model. The bootstrapped confidence intervals suggested that all item factor loadings for the spiritual coping QOL factor were significantly different between the NRS and RS groups, suggesting the absence of partial metric invariance. However, only two item factor loadings for the existential QOL factor were significantly different between the NRS and RS groups, suggesting partial metric invariance. Thus, using the partial metric model as a baseline, we next tested for the full scalar invariance of the existential QOL factor. This full scalar model provided an adequate fit to the data but demonstrated a poorer fit to the data than the partial metric model. The bootstrapped confidence intervals indicated that three of the six

items from the existential QOL factor had different item intercepts, suggesting the absence of partial scalar invariance.

SNR vs. RS. The full metric model demonstrated adequate fit that was similar to the fit of the configural model. The full scalar model demonstrated poorer fit than the full metric model. The bootstrapped confidence intervals suggested that all item intercepts for both factors were significantly different between the SNR and RS groups, suggesting the absence of partial scalar invariance.

ME/I Summary. The consistent presence of configural invariance for both factors suggests that the SQOL-9 has the same basic factor structure across all three groups. The absence of partial metric invariance between the NRS and RS for the spiritual coping QOL factor suggests the meaning of this factor is different for those in each group because the items which most strongly define the factor differ by group. However, this factor holds similar meaning when the SNR are being compared with either of the other groups.

The consistent presence of at least partial metric invariance for the existential QOL factor suggests that this factor has a similar meaning for each of the three groups. However, the inconsistent presence of at least partial scalar invariance for the existential QOL factor between the three groups indicates that (a) intergroup differences in observed scores on the existential QOL factor are not necessarily reflective of a true quantitative difference in the same construct when comparing the RS with either the NRS or SNR but that (b) these differences are reflective of a true difference when comparing the NRS and SNR. In sum, the lack of evidence for strong ME/I indicated that H2 was not supported.

SQOL or Coping

The latent correlation between positive religious coping and spiritual coping QOL was as follows: NRS = .11, $p = .07$; SNR = .76, $p < .001$; RS = .80, $p < .001$. For comparison, the correlation between positive religious coping and the existential QOL factor was as follows: NRS = -.10, $p = .12$; SNR = -.05, $p = .34$; RS = .31, $p < .001$. Thus, the spiritual coping QOL factor seems to be empirically redundant with the positive religious coping factor among the RS, though the SNR group's coefficient was .04 away from meeting the redundancy cutoff. Among the NRS this correlation was non-significant. This may be due to the fact that both spiritual coping QOL (raw subscale score $M = 1.19$, $SD = 0.46$, $Median = 1.00$) and positive religious coping (raw subscale score $M = 1.14$, $SD = 0.47$, $Median = 1.00$) exhibited strong floor effects and little variation among the NRS. In sum, H3 was supported for the RS group, marginally supported for the SNR group, and not supported for the NRS.

SQOL's Relationship with Well-Being

Three patterns are worth noting (see Table 3). First, for all three groups, the existential QOL factor demonstrated a strong positive relationship ($M_\beta = .73$) with well-being. Thus, SQOL, as operationalized by the existential QOL factor, does indeed appear to be highly associated with measures of well-being regardless of worldview group. However, there are several instances in which this association reaches empirical redundancy (e.g., $\beta > .80$ with mental health, for all three groups). Second, the spiritual coping QOL factor was unrelated to well-being ($M_\beta = .04$) within the NRS group. Third, the spiritual coping QOL factor had an inverse relationship ($M_\beta = -.21$) with well-being among the SNR and RS. Given the second and third patterns, H4 was not supported. For context, the latent bivariate correlation between spiritual quality of life and well-being for each group was as follows: NRS $M_r = -.01$, SNR $M_r = -.04$, RS $M_r = .11$.

Discussion

The SQOL-9 was designed to facilitate cross-cultural assessment and comparison of spiritual quality of life (SQOL) among those who are NRS, SNR, and RS alike. The present study sought to examine the SQOL-9's factor structure, measurement equivalence/invariance (ME/I), degree of redundancy with positive religious coping, and relationship with well-being across these three groups. The results have important implications for the future worldwide use of the instrument in research and practice.

Factor Structure

A unidimensional measurement model for the SQOL-9 did not provide an adequate explanation for how the SQOL-9's items relate to each other. This suggests that future research should avoid averaging or summing the scores of the nine items to form a total SQOL score. Instead, the adequate fit of a modified version of Krägeloh and colleagues' (2015) model suggests that the SQOL is better defined by two factors: spiritual coping QOL and existential QOL. This suggests that the SQOL-9 should be scored as two subscales. However, the internal consistency of the three-item spiritual coping QOL subscale was below the conventional minimum among the NRS. Examination of the NRS respondents' free-response feedback (see Supplemental Material, e.g., "The first question refers to 'connection with a spiritual being.' I don't see a way to translate this phrase to a non-spiritual definition.") provides a potential explanation for the greater inconsistency of scores across those three items: these spiritual concepts may lack cultural relevance for the NRS, resulting in measurement error.

Measurement Equivalence/Invariance

The absence of scalar invariance for the spiritual coping QOL factor across the three groups means that it is not appropriate to examine group mean differences on this factor. For

example, the SQOL-9 should not be used to answer the research question, “Do the RS report greater spiritual coping QOL than the NRS and SNR?” Any quantitative differences may be a byproduct of measurement differences rather than true latent differences in the degree of spiritual coping QOL.

The presence of metric invariance when comparing the SNR to either of the other two groups means that SNR’s understanding of spiritual coping QOL is similar enough to that of the other two groups that it is appropriate to compare the differential associations between SQOL and other constructs. For example, the SQOL-9 can be used to answer the research question, “Is spiritual coping QOL a better predictor of life satisfaction for the NRS than the NRS or RS?” However, the absence of metric invariance between the NRS and RS indicates that these two group’s understanding of spiritual coping QOL is dissimilar enough that using the SQOL-9 to examine differential associations between these two groups may result in misleading findings.

The existential QOL factor appeared to have a similar conceptual meaning across the three groups (i.e., metric invariance), allowing examination of differential associations. Comparison of group mean differences on existential QOL between the NRS and SNR is appropriate (partial scalar invariance held), but comparison of scores between either of these two groups and the RS is not appropriate. While SQOL-9 has been marketed for cross-worldview use (Skevington et al., 2013) and is already being used to compare SQOL across these groups (e.g., Akrawi et al., 2017), our results suggest caution in using the SQOL-9 in this manner. Using the SQOL-9 to compare associations and group mean differences across these groups may sometimes result in inaccurate conclusions regarding respondents’ quality of life. Inaccurate conclusions may lead to misguided policy or practice decisions that can do a disservice to the people we wish to help. As a hypothetical example, the SQOL-9 may flag NRS healthcare

patients, more so than patients with other worldviews, as being low in SQOL, even if these lower scores are more of a product of measurement error than a true indicator of a quality of life deficit. Based on these scores, healthcare clinic staff may over-administer SQOL interventions to this population in a well-meaning, but culturally insensitive, attempt to correct a perceived deficit.

SQOL or Coping

The spiritual coping QOL factor appeared to be empirically redundant with the positive religious coping factor among the RS and approached redundancy among the SNR. These two factors may essentially be one factor or may be indistinguishable in terms of how they affect responses to their respective items. Some of the items from the two instruments seem to measure the same psychological construct. For example, the spiritual coping QOL item “to what extent does any connection to a spiritual being help you get through hard times” and the positive religious coping item “[I coped with a negative event in my life by looking] for a stronger connection with God” both seem to be asking about coping via spiritual connection. We recommend future researchers use bifactor analysis and ancillary bifactor measures to thoroughly investigate the dimensionality of these two factors to determine whether the variance across these two sets of items is best explained by a strong general factor (Rodriguez, Reise, & Haviland, 2016). Such an outcome would provide strong evidence of redundancy.

When developing an instrument, researchers must provide discriminant evidence of validity, meaning that the new instrument must demonstrate empirical independence from existing constructs (The Standards for Educational and Psychological Testing; American Education Research Association, American Psychological Association, & National Council on Measurement in Education, 2014). Otherwise, scholars risk contributing to construct

proliferation (Shaffer, DeGeest, & Li, 2016) and committing tautology when seeking to answer questions such as “does the more frequent use of positive religious coping enhance SQOL?” Thus, we echo the recommendation of Krägeloh and colleagues (2015), who suggested that the spiritual coping QOL items be revised to more effectively measure SQOL rather than an existing coping construct. Making a conceptual argument that two constructs are different is necessary but not sufficient; each facet of the new construct must also demonstrate unequivocal empirical independence (Le, Schmidt, Harter, & Lauver, 2010).

If we treat the spiritual coping QOL factor as a measure of spiritual coping, it becomes informative to examine this factor’s correlation with existential QOL. These two factors were unrelated among the NRS and SNR, indicating that these non-religious respondents’ existential QOL was unrelated to their use (or non-use) of spiritual coping strategies such as connecting with or having faith in a higher power. This makes sense particularly for the NRS, as the use of strategies that require belief in something that such respondents do not believe in may naturally prove ineffective at enhancing quality of life. This serves as a useful reminder to scholars and health professionals interested in SQOL: spiritual connection, faith, and strength may be palliative for some people but not for everyone. We must be mindful not to force spiritual interventions on those whose worldviews do not incorporate such concepts. Otherwise, we risk committing microaggressions against those we are seeking to help (e.g., the use of “spiritual fitness” interventions with atheists; Hammer, Cragun, & Hwang, 2013).

SQOL’s Relationship with Well-Being

Existential QOL was highly associated with well-being, as operationalized by meaning in life, satisfaction with life, and mental and physical health. This was true regardless of worldview group. This aligns with the dominant narrative in the spirituality and health literature—that

SQOL is good for everyone (Isaac, Hay, & Lubetkin, 2016). Importantly, existential QOL demonstrates sufficient variability and convergent evidence of validity even among the NRS, which is not always the case for spirituality constructs (Hammer & Cragun, in press). This suggests that the existential QOL items of the SQOL-9 measure a construct that has relevance to NRS persons, which is congruent with the aims of the developers (Skevington et al., 2013).

That being said, the free-response feedback offers some helpful suggestions regarding improvements that could be made to the wording of these items to make them clearer to NRS respondents. Most feedback focused on the “balance” item, which was seen as difficult to answer properly because it assumed belief in a soul (e.g., “I can’t have balance that includes a soul if I do not believe that I have a soul.”). The “meaning” and “purpose” items were also critiqued (e.g., “While I put ‘not at all’ for life having meaning/purpose, I mean that LIFE doesn't provide meaning/purpose. It's up to me to create it. If you were to ask ‘to what extent do you feel like you find/give purpose to life’ I would say I agree. I don't think life itself comes with meaning/purpose. We evolved here. No meaning. No purpose. It's important that we create it, so we don't go bananas.”). NRS perspectives differ regarding whether meaning in life is inherent or created (Hammer, Cragun, & Hwang, 2013), so we recommend the items be reworded such that the content is meaningful for all NRS persons.

More pressing than item rewording, however, is the need to address the present evidence of empirical redundancy between the existential QOL factor and three of the well-being factors (i.e., meaning in life for NRS, satisfaction with life for RS, and mental health for all three groups). Although a strong association is expected, given that the concept of SQOL is inclusive of meaning/satisfaction with life and good mental health, it raises questions about the discriminant evidence of validity of this factor. As noted in the introduction, to avoid construct

proliferation, when introducing a new concept and instrument, it needs to provide an incremental contribution to science beyond existing instruments that are well-established and psychometrically supported. Thus, we recommend that future researchers investigate this discriminant evidence issue in novel samples to determine if this is a result of sample idiosyncrasy or an enduring property of the SQOL-9 that would benefit from scale redevelopment.

Turning now to the other SQOL-9 factor, spiritual coping QOL evidenced a much different pattern. Among the SNR and RS, this factor had an inverse relationship with well-being (when controlling for the effect of existential QOL). There are different ways to interpret this finding. On one hand, this may suggest that existential QOL matters for well-being whereas spiritual coping QOL, specifically, is counterproductive to well-being. However, such a conclusion diverges from published spiritual coping literature (Isaac et al., 2016).

On the other hand, this may suggest that, when existential QOL is held constant, the spiritual coping QOL items actually function as an inadvertent proxy measure for adversity/stress. These items ask to what extent the respondent has had to use spiritual mechanisms to cope with challenges and/or achieve comfort. It stands to reason that the more people have had to use such mechanisms, the more they have been presented with challenges and stressors. The positive aspect of such coping is already being statistically accounted for by the existential QOL factor, leaving the spiritual coping QOL to act as an inverse proxy. This is the more complicated, but we think more credible, explanation. This should be directly tested in future research using a measure of stressful life events.

Among the NRS, spiritual coping QOL was unrelated to well-being. Given this group's lack of variability on this factor, it is unsurprising that no association was found with well-being.

Furthermore, this nonsignificant relationship may raise questions about whether spiritual coping QOL is a culturally relevant construct among the NRS. This aligns with the findings of Akrawi and colleagues (2017), who noted that this factor failed to account for additional variance in Australian college women's disordered eating pathology when existential QOL was controlled.

Addressing Limitations through Future Research

The present findings should be interpreted in the context of this study's limitations. First, there are alternative methods of categorizing persons into religious/spiritual groups (e.g., labels such as "Protestant Christian" and "atheist", scores on intrinsic/extrinsic religiousness) than the present approach. Each method has its strengths and weaknesses, and for this reason we invite future researchers examining the SQOL-9 across religious/spiritual groups to adopt one of these alternative methods to allow for fruitful cross-comparison of findings. Our use of worldview groups means that people with different labels ended up in the same group (see Supplemental Material for a breakdown of labels by worldview group). For example, the SNR group contained people who self-identified as atheists, pagans, and Christians. While all these individuals may identify as SNR, the nature of that spirituality could reasonably be expected to vary in important ways, which could shape the present results (e.g., greater variety in response patterns within a single worldview group, making non-invariance less likely). Second, our analytical approach did not consider potential differences between the slightly religious/spiritual and the strongly religious/spiritual, who might differ as much as the NRS or SNR do. Thus, a dimensional approach to examining the performance of the SQOL-9 across persons from diverse worldviews is a desirable next step. Third, the small cell size precluded analysis of those who self-identify as religious but not spiritual, and future research should intentionally attend to this group. Fourth, we recommend the future use of bifactor analysis to explore the dimensionality of SQOL-9 and

other spirituality instruments, given its ability to determine the degree to which an instrument is unidimensional versus multidimensional, not just which of the two binary options is best (Rodriguez et al., 2016). Fifth, the large convenience sample used is not representative of the U.S. population and overrepresented white educated women, so future research should seek to recruit People of Color, those with less education, and more religious persons from non-Christian faith traditions. Sixth, the SQOL-9 is but one measure of spiritual well-being and the findings (e.g., lack of invariance) from the present investigation do not necessarily apply to other measures of spiritual well-being. Rather, direct tests of those alternative instruments are necessary. We appreciate the cross-cultural approach to developing the SQOL-9's items and have a suggestion for the next iteration of the instrument: prioritize collecting cognitive interview data from NRS and SNR persons from different countries when redeveloping items and pilot test the instrument in samples exclusively composed of NRS and SNR persons to ensure cultural sensitivity and avoid floor effects for all items.

Conclusion

The SQOL-9 is a multidimensional instrument with factors that vary in their degree of conceptual consistency and comparability across those who are NRS, SNR, and RS. This inconsistency puts boundaries on how the SQOL-9 can be used across these worldview groups and the violation of these boundaries increases the risk of coming to misleading conclusions. The spiritual coping QOL factor may measure spiritual coping more than spiritual quality of life; revisions to this factor's items may be necessary to ensure that this facet of SQOL achieves clear discriminant evidence of validity. The existential QOL factor is robustly related to well-being regardless of worldview group membership, but requires future discriminant evidence of validity. The spiritual coping QOL factor is unrelated (for NRS) or inversely related to well-

being (for SNR and RS), which raises questions about what it uniquely accounts for when existential QOL is already being measured. In summary, the SQOL-9 functions differently depending on one's worldview. Social scientists have longed for spirituality instruments that work across all cultures and allow equitable comparison among people from different worldviews. The present findings reinforce the idea that, in spite of rigorous multinational scale development efforts such as those conducted by the WHOQOL SPRB Group for the SQOL-9, such universal instruments are challenging to realize. However, these findings highlight the beauty of our human diversity: the way we make meaning of our SQOL is powerfully defined by our social locations.

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Table 1

Goodness of Fit Statistics for All Tested Confirmatory Factor Analysis Models

Model	Scaled χ^2	<i>df</i>	RMSEA [90% CI]	CFI	TLI	SRMR
Unidimensional NRS*	365.46	27	.160 [.146, .175]	.648	.530	.121
Unidimensional SNR	1051.43	27	.269 [.255, .282]	.420	.227	.243
Unidimensional RS	1834.59	27	.260 [.250, .270]	.462	.283	.147
Seven-Item Two Correlated Factors Model NRS	54.21	13	.081 [.059, .103]	.925	.879	.034
Seven-Item Two Correlated Factors Model SNR	71.96	13	.093 [.073, .114]	.958	.932	.046
Seven-Item Two Correlated Factors Model RS	114.62	13	.089 [.074, .104]	.960	.936	.040
Nine-Item Two Correlated Factors Model NRS	189.93	26	.114 [.829, .764]	.829	.764	.052
Nine-Item Two Correlated Factors Model SNR	181.25	26	.107 [.092, .122]	.912	.878	.050
Nine-Item Two Correlated Factors Model RS	262.31	26	.096 [.085, .107]	.930	.903	.043
Modified Nine-Item Two Correlated Factors Model NRS	85.41	25	.070 [.054, .087]	.937	.909	.038
Modified Nine-Item Two Correlated Factors Model SNR	112.79	25	.082 [.067, .097]	.950	.928	.047
Modified Nine-Item Two Correlated Factors Model RS	142.33	25	.069 [.058, .080]	.965	.950	.037

* This model's global fit is not trustworthy because of a non-positive definite first-order derivative product matrix.

Note: All models were statistically significant at the $p < .001$ level. NRS = neither religious nor spiritual group, SNR = spiritual but not religious group, RS = religious and spiritual group. Statistics are based on MLR estimation. Scaled χ^2 = scaled chi-square test statistic, RMSEA = Root Mean Square Error of Approximation, CI = Confidence Interval, CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, SRMR = Standard Root Mean Square Residual.

Table 2

Goodness of Fit Statistics for Measurement Equivalence/Invariance Models

Model	Scaled χ^2	<i>df</i>	RMSEA [90% CI]	CFI	TLI	SRMR	Δ CFI	Δ RMSEA	Δ SRMR	Model comparison
NRS vs. SNR										
Configural	199.01	50	.077 [.066, .068]	.945	.920	.043				
Metric	226.38	57	.077 [.066, .087]	.937	.920	.057	.008	.000	-.014	Configural
Scalar	281.40	64	.082 [.072, .092]	.919	.909	.065	.018	-.005	-.008	Metric
NRS vs. RS										
Configural	233.12	50	.070 [.061, .080]	.957	.938	.037				
Metric	281.28	57	.073 [.064, .082]	.947	.933	.058	.010	-.003	-.021	Configural
Scalar*	418.20	59	.091 [.038, .099]	.915	.897	.076	.032	-.018	-.018	Metric
SNR vs. RS										
Configural	257.04	50	.074 [.065, .083]	.960	.942	.041				
Metric	271.34	57	.070 [.062, .079]	.958	.948	.052	.002	.004	-.011	Configural
Scalar	379.78	64	.081 [.073, .089]	.939	.931	.074	.019	-.011	-.022	Metric

* This model's global fit is not trustworthy because of a non-positive definite first-order derivative product matrix.

Note: All models were statistically significant at the $p < .001$ level. NRS = neither religious nor spiritual group, SNR = spiritual but not religious group, RS = religious and spiritual group. Statistics are based on MLR estimation. Scaled χ^2 = scaled chi-square test statistic, RMSEA = Root Mean Square Error of Approximation, CI = Confidence Interval, CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, SRMR = Standard Root Mean Square Residual.

Table 3

Standardized Betas Quantifying the Relationship between SQOL-9 and Well-Being

Group	Predictor	Meaning in Life	Satisfaction with Life	Mental Health	Physical Health
NRS					
	Spiritual Coping Quality of Life Factor	.03	.03	.08	.01
	Existential Quality of Life Factor	.80	.69	.81	.41
SNR					
	Spiritual Coping Quality of Life Factor	-.02	-.17	-.20	-.21
	Existential Quality of Life Factor	.77	.78	.85	.56
RS					
	Spiritual Coping Quality of Life Factor	-.04	-.29	-.34	-.41
	Existential Quality of Life Factor	.76	.84	.93	.56

Note: SQOL-9 = Spiritual Quality of Life-9 instrument, NRS = neither religious nor spiritual, SNR = spiritual but not religious, RS = religious and spiritual. Standardized betas are based on MLR estimation. All bolded standardized betas were significant at $p < .05$.