

Spiritual Well-Being and Health

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Abstract: Data on empirical associations between religious variables and health outcomes are needed to clarify the complex interplay between religion and mental health. The aim of this study was to determine whether associations with health variables are primarily attributable to explicitly religious aspects of spiritual well-being (SWB) or to “existential” aspects that primarily reflect a sense of satisfaction or purpose in life. Three hundred forty-five pairs of twins from the Vietnam Era Twin Registry completed a diagnostic interview and questionnaires containing the 2-factor SWB Scale and general health items. Observed associations between SWB and health outcomes were uniquely explained by the SWB subscale of existential well-being, with much less of a unique explanatory contribution from religious well-being or “spiritual involvement.” We concluded that studies of SWB and health should continue to distinguish between explicitly religious variables and others that more closely approximate the psychological construct of personal well-being.

Key Words: Religion, mental health, spiritual well-being, twins.

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One of the many uses of the concept of spiritual well-being (SWB) has been to undertake empirical investigations of the relationship between a measurable—though clearly delimited—aspect of religion/spirituality and various indices of mental and physical health (Beery et al., 2002; Fernsler et al., 1999; Riley et al., 1998). The aim of this study was to further pursue this line of research to investigate the degree to which observed associations can be attributed to psychometrically sound and conceptually distinct components of SWB that have potential utility in etiologically focused research.

“SWB” was introduced into the scientific literature as part of the social indicators approach to quality of life research (Moberg, 1979). An early and influential definition specified that SWB “pertains to the wellness or ‘health’ of the totality of the inner resources of people, the ultimate concerns around which all other values are focused, the central philosophy of life that guides conduct, and the meaning-giving center of human life which influences all individual and social behavior” (Moberg, 1979, p. 11).

Subsequent investigators have proposed related but distinct definitions of SWB as part of the process of constructing instruments that can be applied to measure SWB and to relate that construct to other domains of interest (Cella et al., 1993; Moberg, 1984; Paloutzian and Ellison, 1982; Peterman et al., 2002). One of the most widely used measurement tools in this context is the SWB Scale (SWBS) (Paloutzian and Ellison, 1982), a self-rating questionnaire composed of two 10-item subscales designed to measure “religious well-being” (RWB) and “existential well-being” (EWB). Accordingly, the SWBS can be said to measure the quality of an individual’s inner or “spiritual” life in 2 senses: (1) a religious sense (RWB), which refers specifically to the quality of an individual’s “relationship with God”; and (2) an existential sense (EWB), which refers to the individual’s general sense of satisfaction or purpose in life (Bufford et al., 1991). In this article, we focus on the empirical relationship of the SWBS and its component subscales to physical and mental health outcomes.

Several studies have reported positive associations between SWB and other measures of quality of life in persons with serious physical illnesses including heart failure (Beery et al., 2002) and gynecologic cancer (Gioiella et al., 1998). In a more extensive investigation, Riley et al. (1998) used responses to the SWBS and the Functional Assessment of Cancer Therapy—SWBS to separate their sample of 216 inpatients with chronic physical illnesses into 3 groups la-

beled “religious” (68%), “existential” (17%), and “nonspiritual” (14%). The latter group had significantly lower ratings of life satisfaction and quality of life on a number of measures, including variables reflecting functional and physical status, bodily pain, and health change. However, contrary to the authors’ expectation, the religious and existential groups showed little evidence of differences on any of the life satisfaction and quality of life measures.

Fernsler et al. (1999), comparing SWBS and Demands of Illness Inventory (DOII) scores in 121 persons with colorectal cancer, found that “subjects who reported higher levels of SWB indicated significantly lower DOI related to physical symptoms, monitoring symptoms, and treatment issues.” (In this context, “demands of illness” refers to patients’ perceptions of illness-related distress.) Of particular interest to this study was their finding that EWB ratings were negatively correlated with all 7 DOII subscale scores, whereas “no significant relationships were found between the RWB subscale scores and the DOII subscale scores.”

Other empirical studies are of interest because they examined relationships of spiritual well-being, as measured by the SWBS, with psychological constructs including psychological well-being, or because they reported results for particular types of medical conditions. Kaczorowski (1989) compared SWBS and State-Trait Anxiety (Spielberger, 1983) scores in 114 adults with cancer, and reported a negative correlation between SWB and State-Trait Anxiety irrespective of sex, age, marital status, diagnosis, and time since diagnosis. Fehring et al. (1987) surveyed nursing and college students using the SWBS, and found that both SWB and EWB scores (but not RWB scores) were significantly inversely correlated with negative moods, particularly depression. Coleman and Holzemer (1999) analyzed EWB and RWB scores separately in a sample of 117 African Americans with human immunodeficiency virus (HIV)/acquired immune deficiency syndrome (AIDS), and concluded that EWB, more than RWB, was significantly related to the participants’ psychological well-being.

In an earlier study of HIV/AIDS patients, Carson and Green (1992) had correlated SWBS ratings and hardiness as measured by the Personal View Survey (PVS) questionnaire (Kobasa, 1986), and found substantially stronger associations for EWB than for RWB on each of the PVS subscales. Similarly, Carson et al. (1990) found that hope was related more closely to EWB than to RWB in a sample of 66 HIV+ patients with AIDS-related complex (ARC) or AIDS.

The current study was undertaken to address some of the basic issues raised by these previous studies, principally including systematic differences between RWB and EWB in relation to health and religiosity. However, in view of the preliminary nature of this investigation, a comprehensive assessment of religious concerns was not attempted. Instead, a short (4-item) index of “spiritual involvement” (SI) (Tsuang et al., 2002) was employed to represent some of the most prominent features of note including ratings of one’s religious or spiritual orientation and time spent on religious or spiritual practices. Similarly, previous studies of religion and health have often employed measures of religious involvement

defined in terms of religious affiliation or church attendance, either alone or supplemented by more comprehensive assessments (Kendler et al., 1997; Koenig et al., 2001; Powell et al., 2003).

A major objective of the current study was to examine whether SI, RWB, and EWB represent psychometrically validated constructs in a geographically diverse nonclinical sample where there is a range of religious and nonreligious beliefs. Preliminary findings on these scales have been reported previously (Tsuang et al., 2002). We extend these findings in the present report by assessing the psychometric properties of these measures in a substantially larger sample. We also examine the degree to which these measures assess overlapping as opposed to distinct constructs.

A second major objective of the study was to compare the unique associations of SI, RWB, and EWB with physical health and various aspects of mental health. In particular, we examine the degree to which explicitly religious aspects of SWB (e.g., feeling close to or distant from God) and more generic or “existential” aspects (e.g., a general sense of well-being and purpose in life) are associated with good health. Understanding which components of SWB are most closely associated with health could be important for informing future research on causal relationships underlying such associations.

MATERIALS AND METHODS

Participants

Participants were members of the Vietnam Era Twin Registry, a nationally distributed sample of male-male twin pairs in which both members served in the military during the Vietnam era (1965–1975). Zygosity was assigned using questionnaire and blood group methods; this approach has been shown to achieve approximately 95% accuracy when compared with DNA analysis (Eisen et al., 1989). Registry members are representative of all twins who served in the military during the Vietnam War on a variety of sociodemographic and other variables (Goldberg et al., 1987). A complete description of the Registry’s construction is available elsewhere (Eisen et al., 1987; Henderson et al., 1990). In 1991, a structured psychiatric interview was conducted by telephone to obtain psychiatric diagnoses as part of the Harvard Twin Study of Drug Abuse and Dependence. There were over 3300 pairs (>6600 individuals or “singletons”) in which both members of a pair participated.

In 1996–2001, 692 individuals (345 pairs and 2 singletons) from these randomly selected 3300 pairs were recruited for participation in a twin study of vulnerability to alcoholism. Twins were randomly selected from among those pairs where neither twin served in Vietnam. To be included, both members of a pair had to agree to participate by signing a statement of informed consent. Participants were then flown to the University of California, Davis in Sacramento, or to Harvard Medical School in Boston. Participants were given their choice of study site.

The 2 singletons were excluded from the current study, leaving a sample of 690 individuals in 345 twin pairs. There

were 176 monozygotic and 169 dizygotic pairs; 181 pairs were tested in Boston, 163 in Sacramento, and 1 pair in their hometown. In virtually all cases, both members of a pair came together to the same site. The mean age of all participants was 47.8 years ($SD = 3.3$, range = 41–58); 92.2% were Caucasian, 5.5% were African American, 1.9% were Hispanic, and .4% were of other racial origin. In addition, 96.7% were high school and 33% were college graduates; 79.1% were married, 12.1% divorced, and 8.8% widowed, separated, never married, or refused response. Among participants reporting full-time (92.2%) or part-time (1.6%) employment, 33.5% held service or manual labor positions, 24.4% held clerical or semiprofessional positions, and 41.1% held professional positions. The median household income category was \$60,000–\$70,000.

Measures

Dimensions of SWB and SI were assessed by questionnaire. The 4 items comprising the index of SI were derived in part from the “strength” and “practices” items in the Index of Core Spiritual Experiences (Kass et al., 1991) that were the most relevant to this study. The 3 self-report items address one’s degree of SI, level of involvement relative to others, and frequency of religious/spiritual practices. The remaining item is from the cotwin’s questionnaire, namely, his estimate of his twin’s degree of SI. The index of SI was created by summing the z -scores of the 4 items comprising the index. This was necessary because one of the items (“About how often do you spend time on religious or spiritual practices?”) is categorical, whereas the others ask for a numerical rating from 0 to 100. Higher scores indicate greater involvement. Psychometric properties of the SI index were reported in Tsuang et al. (2002) and support the continued use of the instrument in this sample.

Other questionnaire items were from the SWBS (Ellison, 1983), a self-report instrument with 2 subscales: RWB and EWB. To facilitate interpretation, item scoring was reversed, so higher scores on the SWBS would denote greater well-being. The SWBS was chosen because it possesses a number of positive features including an easy-to-use format, brevity, flexibility of use (e.g., self-administration or interview), a consistent theoretical justification in terms of RWB and EWB, and fairly well-documented psychometric properties, including studies of reliability and validity (Boivin et al., 1999; Ledbetter et al., 1991).

Previous studies have found the SWBS to be a reliable instrument when administered to a wide range of populations from hospice patients (Kirschling and Pittman, 1989) to college students (Ellison, 1983). Several previous investigators (Fernsler et al., 1999; Gioiella et al., 1998; Kirschling and Pittman, 1989) have noted that some respondents had difficulty answering SWBS questions phrased in terms of references to God, which appear in all 10 RWB items. For this reason, and consistent with Ellison (1983), participants were instructed to use their own definition of words such as “prayer” or “God.”

Mental health outcomes were collected as part of the Harvard Twin Study of Drug Abuse and Dependence (Tsuang

et al., 2001), which was conducted in 1992. Diagnostic data on major depression, alcohol dependence, drug dependence, and nicotine dependence were collected using the NIMH Diagnostic Interview Schedule Version III—Revised (DIS-III-R) (Robins et al., 1988). The structured questions from the DIS-III-R lead to clinical diagnoses according to the Diagnostic and Statistical Manual for Mental Disorders, Third Edition Revised (DSM-III-R) (American Psychiatric Association, 1987).

Physical health measures included blood pressure, body mass index (BMI), self-reported health problems, and the SF-36 (Ware et al., 1993). Blood pressure was treated as a continuous variable for systolic and diastolic blood measures and also as a dichotomous variable with high blood pressure (hypertension) defined as systolic pressure of at least 140 mm Hg or diastolic pressure of at least 90 mm Hg. BMI refers to a relationship between height and weight that indexes body fat as a risk factor for poor health. BMI is calculated by dividing weight in kilograms by the square of height in meters.

The SF-36 is a 36-item self-report measure of quality of life, including 8 subscales reflecting physical and mental health. The subscales are: physical functioning, role interference caused by physical problems, bodily pain, general health, vitality, social functioning, role interference caused by emotional problems, and mental health. Higher scores on the SF-36 indicate greater satisfaction and healthy functioning. The SF-36 is currently the most widely used measure of general health-related quality of life in medical settings and its psychometric properties are well documented (Ware et al., 1993).

Statistical Analyses

Psychometric Properties

Interitem reliability for the measures of SI, SWB, RWB, and EWB was calculated using Cronbach’s α coefficient. So as not to violate statistical assumptions of the nondependence of observations, we analyzed each member of a twin pair separately by randomly assigning each twin to 1 of 2 equal-sized groups, arbitrarily labeled as “group A” and “group B”.

Principal Components Analysis of the SWBS

To examine whether our data support the “2-factor” (EWB vs. RWB) structure of the SWBS, we employed principal components analysis to extract factors from the 20 scale items. Data from group A were used to determine the optimal number of factors. The number of eigenvalues greater than 1.0 and the scree plot determined the factor solution. Once the number of factors was selected, promax (oblique) rotation, which allows for correlated factors, was used to determine item loadings on each factor. Data from group B were then used to verify the optimal group A solution. However, inasmuch as group B is not an independent sample, analyses on group B provide only a partial validation of the results for group A.

Relationships Among SWB, SI, and Health Outcomes

For these analyses, data from all twins were combined (i.e., not separated into groups A and B). We first conducted univariate analyses of the relationship between the measures of SWB (RWB and EWB), SI, and the various indices of mental and physical health. The odds ratio (OR) and 95% confidence interval (CI) for the association between these measures and categorical health outcomes were calculated using logistic regression. Associations of RWB, EWB, and SI with continuous physical health outcomes (BMI, blood pressure, and the SF-36 scales) were examined by using zero-order correlations.

The next group of analyses addressed health variables that were significantly related to more than one explanatory variable in the initial univariate analyses. As a first approach to statistical modeling, we employed hierarchical regression models, adjusted for age of respondent, to determine which variables of interest made a unique contribution to the variance in health outcomes. Ordinary least-squares regression was used for continuous outcomes and logistic regression was used for categorical outcomes. RWB, EWB, and SI were included in 3 separate models for each health outcome, alternating which variable was entered last into the regression model. For ease of interpretation, RWB, EWB, and SI were standardized with a mean of 0 and standard deviation (*SD*) of 1.

Because data were collected on more than one individual from a family, analyses were based on the ROBUST Huber/White/Sandwich variance estimator (Huber, 1967; White, 1980) with the CLUSTER option using STATA 7.0 (StataCorp, 2001). Specifying ROBUST replaced model-based variance estimates with variances that give accurate assessments of the sample-to-sample variability of the parameter estimates even when the model is misspecified. Combined with the CLUSTER option, this analysis adjusts estimated standard errors to account for the nonindependence of data from individuals in the same family (Rogers, 1993; Williams, 2000).

Multiple Comparisons

As an aid to interpretation and potential future replication, the Bonferroni correction was used to control the type I error rate in multiple comparisons.

RESULTS

Psychometrics

All explanatory variables of interest (SWB, RWB, EWB, and SI) had very high internal consistency as shown by values of Cronbach's α ranging from .87 to .95. Furthermore, successive elimination of individual items had little effect on the value of α for the remaining items, indicating that no single item overly influenced the scale scores.

The index of SI was correlated more closely with the RWB Scale ($r = .83$) than with the EWB Scale ($r = .46$). The RWB and EWB scales were moderately correlated at $r = .54$. Correlations were significant at $p < .001$.

Principal Components Analysis

The principal components analyses of the SWBS items from both group A and group B led to a similar partitioning of most, but not all, items into 2 distinctive factors corresponding closely to the RWB and EWB subscales.

The initial (group A) analysis of the 20 SWBS items yielded 3 factors with eigenvalues greater than 1.0. The first 2 factors accounted for 61% of the variance, whereas the third factor only accounted for 5% of the variance. A 2-factor solution was therefore used in all subsequent analyses. An interpretation of the 2-factor solution was attempted using a promax rotation. The RWB items had item loadings on the first factor ranging from .68 to .92, and item loadings on the second factor ranging from $-.14$ to .10. In contrast, EWB items had item loadings on the second factor ranging from .40 to .85, and item loadings on the first factor ranging from $-.18$ to .17. EWB item 10 ("I believe there is some real purpose for my life") loaded about equally on both factors, .38 and .40, respectively. The correlation between the 2 factors was .51. The results from group B were very similar, including the ambiguous factor loadings for EWB item 10.

Relationships Between SWB, SI, and Health Outcomes

Table 1 contains the ORs and 95% CIs quantifying the relationship between RWB, EWB, SI, and individual psychiatric disorders identified by DSM-III-R diagnoses of major depression, alcohol dependence, drug dependence, and nico-

TABLE 1. Odds Ratios and 95% Confidence Intervals for Associations Between Spiritual Involvement and Spiritual Well-Being Measures and Lifetime DSM-III-R Axis I Psychiatric Disorders ($N = 690$ Participants)

DSM-III-R Lifetime Disorder	Spiritual Involvement Index ^a	Religious Well-Being Subscale ^a	Existential Well-Being Subscale ^a
Major depression	0.79 (0.58–1.08)	0.76* (0.60–0.97)	0.59* (0.39–0.89)
Alcohol dependence	0.76*** (0.65–0.88)	0.72*** (0.61–0.85)	0.72*** (0.68–0.77)
Drug dependence	0.70*** (0.66–0.74)	0.68*** (0.64–0.73)	0.65** (0.48–0.87)
Nicotine dependence	0.73*** (0.72–0.75)	0.71*** (0.70–0.72)	0.69*** (0.56–0.86)

^aExpressed in standard deviation (*SD*) units. For example, 1 *SD* unit increase in religious well-being is associated with a 24% decrease in the odds of having a lifetime diagnosis of major depression.

* $p < .05$.

** $p < .01$.

*** $p < .001$. Only p values $< .001$ are considered significant using a Bonferroni correction.

tine dependence. All of the ORs in Table 1 are less than 1.0, indicating that higher values of SI, RWB, and EWB are associated with reduced lifetime risks for these DSM-III-R disorders. The associations are statistically significant for all comparisons except those involving major depression. The degree of the risk reduction can be quantified using the magnitude of the relevant OR. For example, a 1 SD increase in RWB was associated with 0.76 times the odds of having a lifetime diagnosis of major depression. In other words, a 1 SD increase in RWB was associated with a 24% decrease in the odds of having major depression (or between 3% and 40% using the 95% CI).

Table 2 displays correlations between RWB, EWB, SI, and various health outcomes. The results generally indicate that higher values of RWB, EWB, and SI are associated with positive mental health and with nonspecific indices of good physical health. Overall, EWB had the strongest associations with the SF-36 measures of health; for example, physical functioning, bodily pain, and role impairment-emotional were significantly correlated only with EWB. On the other hand, lifetime smoking and the SF-36 scales of general health, vitality, social functioning, and mental health were significantly correlated with EWB and at least one other measure. All of the correlation coefficients involving blood pressure and body fat (indexed using BMI) were close to 0, and none approached statistical significance.

Results of hierarchical logistic regression analyses indicated that most of the statistical associations with lifetime mental disorders displayed in Table 1, with the exception of major depression, could not be explained by the unique contribution of SI, RWB, or EWB. Only EWB, when entered last, contributed uniquely to the model predicting major depression ($\chi^2(1) = 7.09, p < .01$). EWB was also the only significant predictor in the full model of a decreased risk of major depression (OR = 0.59, $p < .001$). There was some evidence that SI uniquely improved the fit of the model for

nicotine dependence ($\chi^2(1) = 4.13$, nominal $p < .05$ but not significant after the Bonferroni correction). None of the SI, RWB, or EWB measures contributed unique variance to alcohol dependence or drug dependence.

Hierarchical linear regression analyses of the continuous health variables in Table 2 having significant correlations with EBW and at least one other measure showed unique contributions attributable only to EWB. The full model (using SI, RWB, and EWB) provided an adequate fit to the data for lifetime smoking, general health, vitality, social functioning, and mental health. Comparisons of the full model with various reduced models indicated that only the addition of EWB contributed unique variance to the models for general health ($F(1, 345) = 19.01, p < .01$), vitality ($F(1, 345) = 18.54, p < .01$), mental health ($F(1, 345) = 50.78, p < .001$), and social functioning ($F(1, 345) = 9.2, p < .05$ but considered ns after the Bonferroni adjustment). EWB was also the only significant predictor ($p < .001$) in the full model for these outcomes. None of the SI, RWB, or EWB measures uniquely contributed to the correlations involving lifetime smoking.

DISCUSSION

Scientific study of relationships between religious variables and health requires the development of reliable and valid measures of the various components hypothesized to affect health (Hill and Pargament, 2003). Factor analyses in this study indicate that RWB and EWB represent phenomenologically distinct constructs, consistent with the original formulation of the SWBS by Paloutzian and Ellison (1982). Our findings also suggest that the SWBS and its RWB and EWB subscales, as well as our brief index of SI, have acceptable psychometric properties including excellent internal consistency in our nonclinical sample of male veterans.

Overall, our study replicates those of others who have found positive associations between mental health and our explanatory variables of interest, namely SWB and SI (Kendler et al., 1997; Koenig et al., 2001; Powell et al., 2003). In marked contrast, evidence suggesting a link to positive physical health was much less consistent and less convincing.

These findings were clarified when we followed the suggestion of Koenig et al. (2001) to analyze the RWB and EWB scales separately. RWB and EWB (as well as SI) all had significant positive associations with general health and mental health outcomes, but EWB was clearly the variable remaining significant in hierarchical analyses that adjusted for the presence of the other variables. In other words, the general pattern was that only EWB contributed unique variance to observed associations between SWB and health outcomes. Similarly, Fernsler et al. (1999) noted a pattern of published studies that “documented the more powerful associations of EWB than RWB with lower anxiety (Kaczorowski, 1989), higher levels of hope (Mickley et al., 1992), higher levels of psychosocial adjustment (Landis, 1996), and positive mood states (Fehring et al., 1987).” Other investigators who have found substantially

TABLE 2. Zero-Order Correlations for Spiritual Involvement and Spiritual Well-Being Measures and Health Outcomes (N = 690 Participants)

	Spiritual Involvement	Religious Well-Being	Existential Well-Being
Systolic blood pressure	.07	.05	.03
Diastolic blood pressure	.10	.07	.06
Body mass index	.02	.03	-.01
Lifetime smoking (in pack yr)	-.22***	-.20***	-.22***
SF-36 physical functioning	.05	.05	.16***
SF-36 role impairment-physical	.08	.10*	.14**
SF-36 bodily pain	.04	.08	.16***
SF-36 general health	.18***	.21***	.41***
SF-36 vitality	.11*	.16***	.41***
SF-36 social functioning	.10*	.15***	.32***
SF-36 role impairment-emotional	.04	.08	.23***
SF-36 mental health	.18***	.23***	.59***

* $p < .05$.

** $p < .01$.

*** $p < .001$. Only p values $< .001$ are considered significant using a Bonferroni correction.

stronger associations for EWB than for RWB include Carson and Green (1992) for increased hardiness, Coleman and Holzemer (1999) for higher levels of psychological well-being, and Fernsler et al. (1999) for reduced demands of illness with colorectal cancer. The general pattern was succinctly stated by Fehring et al. (1987) in discussing the potential role of SWB as a mediator of stress-induced depression: “for the college students in (this) study, this mediation was reflected in a purpose and satisfaction in life (EWB) and not to a relationship with God (RWB).”

Associations that are specific and unique, such as those observed here with EWB, are generally the most interesting from the standpoint of scientific explanation or etiologic research. In contrast, there was less evidence in this health outcomes study of a unique explanatory role for RWB. However, RWB is only one aspect of religious attitudes, beliefs, and practices that might have scientific relevance for studying mental and physical health. For example, Peterman et al. (2002) have argued that the RWB subscale of the SWBS is narrowly focused on the respondent’s personal relationship with his/her God, a concept that “is central to Evangelical Protestantism but not equally significant in other branches of Christianity or other faith traditions.” For a broader approach to religiosity, investigators can consider using conceptualizations such as the various dimensions of the Brief Multidimensional Measure of Religiousness/Spirituality (Fetzer Institute, 1999; Idler et al., 2003) and similar scales (Hill and Hood, 1999; Koenig, 1998; Koenig et al., 2001; Peterman et al., 2002), religious commitment (Ellison et al., 1989), religious quest (Batson, 1976), as well as dimensions of belief and behavior that characterize “the spiritual lives of nonreligious persons” (Thomason and Brody, 1999).

Potential limitations of this research must also be considered. The data are cross-sectional and therefore cannot address the temporal relationships between our explanatory measures and health outcomes. It is entirely possible that health status (including mental illness) could influence an individual’s spiritual or psychological well-being, and various feedback loops are possible. Potentially more informative approaches, such as path analysis, would require us to specify directional relationships among the spirituality and health variables and so were not employed in this initial exploratory study.

An additional limitation is that some health measures (e.g., DSM-III-R diagnoses) were assessed approximately 10 years before the other measures used in this study. The sample consisted entirely of male Vietnam Era veterans, whereas relationships between SWB and health may differ by gender or civilian versus military status, perhaps rendering some of our comparisons with prior studies somewhat problematic. Another limitation was that we employed only a limited assessment of traditional religiosity, which can be more comprehensively assessed using a wide variety of multidimensional instruments (Fetzer Institute, 1999; Hill and Hood, 1999; Koenig, 1998; Koenig et al., 2001). Finally, our finding that EWB was more strongly related to mental health than RWB or SI may, in part,

reflect the definition of EWB. In the opinion of Koenig et al. (2001), “the . . . EWB subscale assesses well-being unrelated to religion and thus reflects positive mental health.” Accordingly, it could be tautological to look for empirical associations between EWB and mental health variables.

CONCLUSIONS

At a time of renewed interest in relationships between religion and health, our study has demonstrated the importance of distinguishing between explicitly religious variables and instruments and others that tap a primarily “existential” or psychological dimension of personal well-being. This distinction between RWB and EWB is sometimes visualized in terms of “vertical” and “horizontal” dimensions that respectively reflect the relative importance of explicitly religious beliefs and observances versus one’s adjustment “to self, community, and surroundings” in terms of “life purpose, life satisfaction, and positive or negative life experiences” (Boivin et al., 1999). As the imagery of a “horizontal dimension” implies, EWB need not be limited to immediate personal concerns, but can also be viewed as “transcendent” in the sense of being inherently other-directed, implying a balance between individual needs and the well-being of other people, the community, or even humanity in general or all life on earth (cf., Ryan and Deci, 2001). It is also important to note that EWB need not be viewed as excluding religion and religious concerns, but rather as describing a dimension of psychological well-being that forms a core aspect of religious involvement for many individuals and religious traditions (Ellison, 1983). Inasmuch as life meaning, purpose and satisfaction form key concepts for both EWB and psychological well-being (Coleman and Holzemer, 1999), future studies might also profit by employing instruments derived from both the psychological and religious studies traditions.

Although this discussion has emphasized the observed differences between RWB and EWB, we also found (as have other investigators) that these scales are moderately correlated and also share some associations with various health indices of interest to researchers and clinicians. Perhaps the greatest challenge confronting research in this area is to go beyond correlational studies to investigate etiologic influences on SWB and health (Miller and Thoresen, 2003; Seeman et al., 2003; Thoresen and Harris, 2002). One possibility is that a predominantly psychological and not necessarily religious substrate of EWB mediates the relationship between SWB and health (cf., Fehring et al., 1987; Ryff, 1989). Thus, more attention should be given to biopsychosocial mechanisms underlying any associations between SWB and health outcomes, for the reason that such information is essential before such associations can be regarded as biologically plausible and etiologically meaningful. Also, if associations are etiologically interesting, one can expect to observe “dose-response” relationships; or if not, that would also be of interest. Finally, instead of thinking about etiologic rela-

tionships in traditional causal terms (e.g., in a simplistic formulation, that certain religious beliefs and attitudes protect against or lead to specific mental or physical health outcomes), it might be more productive to try to discover etiologic factors that these domains share and similarly interact with over time.

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