
Spirituality, Religion, and Health

An Emerging Research Field

William R. Miller
Carl E. Thoresen

University of New Mexico
Stanford University

The investigation of spiritual/religious factors in health is clearly warranted and clinically relevant. This special section explores the persistent predictive relationship between religious variables and health, and its implications for future research and practice. The section reviews epidemiological evidence linking religiousness to morbidity and mortality, possible biological pathways linking spirituality/religiousness to health, and advances in the assessment of spiritual/religious variables in research and practice. This introduction provides an overview of this field of research and addresses 3 related methodological issues: definitions of terms, approaches to statistical control, and criteria used to judge the level of supporting evidence for specific hypotheses. The study of spirituality and health is a true frontier for psychology and one with high public interest.

It is hardly news that spirituality and religion can have an important influence on human health and behavior. Religious resources figure prominently among the methods that people call on when coping with life stress and illness (Cole & Pargament, 1999; Dein & Stygal, 1997; Koenig, 1997; Pargament, 1997; Pargament, Smith, Koenig, & Perez, 1998). A majority of patients receiving health care say that they would like their caregivers to ask about and discuss spiritual aspects of their illness, with particularly high percentages among patients who regularly attend religious services (e.g., Daaleman & Nease, 1994; Ehman, Ott, Short, Ciampa, & Hansen-Flaschen, 1999; King & Bushwick, 1994).

About 95% of Americans recently professed a belief in God or a higher power, a figure that has never dropped below 90% during the past 50 years, and 9 out of 10 people also said that they pray, most of them (67%–75%) on a daily basis (Gallup & Lindsay, 1999). Many Americans have stated that their faith is a central guiding force in their lives (Gallup, 1985, 1995). Over two thirds (69%) recently reported that they were members of a church or synagogue, and 40% reported that they attended regularly (Gallup & Lindsay, 1999). There are also indications that public interest in spirituality is increasing. In 1998 Gallup polls, 60% of Americans reported religion to be *very important* in their lives, an increase of 7% from 10 years before (Gallup & Lindsay, 1999). More than 4 out of 5 people (82%)

surveyed in 1998 acknowledged a personal need for spiritual growth, up 24% from just 4 years earlier (Gallup & Lindsay, 1999; Myers, 2000). “Across the board . . . surveys confirm a remarkable rise in spiritual concern” (Gallup & Jones, 2000, p. 27).

It is not a particularly new idea to study religion scientifically. William James, a secular founder of American psychology, had a keen interest in religious experience and devoted an important volume to the subject (James, 1902/1961). This volume has been influential in psychology, philosophy, and theology (Barnard, 1997; Hauerwas, 2001). Beyond pragmatic aspects of enduring public interest in the subject (Pickren, 2000), a long tradition exists for the scientific study of religion, although it has evolved in relative isolation from mainstream physical and behavioral sciences (Allport, 1961; Miller, 1999; Shafranske, 1996). In the 20th century, however, as behavioral and health sciences came to be dominated by positivistic and naturalistic viewpoints, the spiritual side of human nature was often considered by psychologists to be immaterial and, thus, by definition, an improper topic for scientific investigation (viewed as the study of the material world).

Why Not Study Spirituality?

At least two basic assumptions have contributed to the neglect of research in this area: (a) the assumption that spirituality cannot be studied scientifically, and (b) the assumption that spirituality should not be studied scientific-

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Author's note. William R. Miller, Department of Psychology, University of New Mexico; Carl E. Thoresen, School of Education and Department of Psychology, Stanford University.

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Correspondence concerning this article should be addressed to William R. Miller, Department of Psychology, University of New Mexico, Albuquerque, NM 87131-1161. E-mail: wrmiller@unm.edu

ically. We believe that neither of these assumptions is scientifically sound.

Spirituality can be studied scientifically. Although it is a topic seldom covered in the training of social, behavioral, and health scientists or practitioners, a very large body of scientific research on spiritual/religious processes already exists (Hood, Spilka, Hunsberger, & Gorsuch, 1996; Koenig, McCullough, & Larson, 2000; Larson, Swyers, & McCullough, 1998). The *Journal for the Scientific Study of Religion* (www.blackwellpublishers.co.uk/asp/journal.asp?ref=0021-8294), for example, has already published 41 volumes. Scientific-professional organizations have included divisions or special interest groups specifically devoted to this area of study. These include, for example, the Association for the Advancement of Behavior Therapy (www.aabt.org/sigs/sigs.html#spiritual), the American Psychological Association's Division 36 (www.apa.org/about/division/div36.html), and the Society of Behavioral Medicine (www.sbmweb.org). Furthermore, a large array of instruments is available for studying religious variables (Hill & Hood, 1999; Hill & Pargament, 2003, this issue), some with well-established psychometric properties, and these instruments have been used in a wide range of studies.

Similarly elusive phenomena, such as complex cognitive processes, emotional states, and the inner workings of psychotherapy, are now regular topics of scientific study. The July 1999 issue of the *American Psychologist*, for example, was devoted to scientific evidence demonstrating that most human behavior is regulated by implicit nonvolitional processes that are not readily observable (e.g., Bargh & Chartrand, 1999; Kirsch & Lynn, 1999). Some understandable confusion exists about how best to study spiritual/religious factors and how to interpret the results of empirical studies in this area (Oman & Thoresen, 2002). There is, however, little scientific basis for assuming that spirituality cannot be studied (Easterbrook, 1997).

The scientific method does not specify what should be studied. Such decisions are a function of the values preferred by scientists (H. Kendler, 1999; Suppe, 1977). Arguments that scientists ought not to study a particular topic are necessarily ethical in nature. Scientific findings may provide information that is pertinent to ethical arguments, but such findings do not determine or substantiate the philosophical presuppositions and value orientations (such as what constitutes the good of a population) from which ethical arguments arise.

The articles in this special section discuss evidence supporting, in varying degrees, a generally positive relationship between religiousness and wellness, although the reasons or causes for this common correlation remain unclear. As indicated above, a large majority of U.S. citizens have reported a belief in God and a religious affiliation. A substantial minority have stated that their spiritual faith is the single most important influence in their lives (Gallup, 1985, 1995), and its subjective importance generally increases among those who are dealing with serious illness (e.g., Baider et al., 1999; Dein & Stygal, 1997; Ehman et al., 1999; Holland et al., 1999). Spirituality has been found

to be an important and unique component in patients' ability to cope with serious and chronic illnesses (e.g., Brady, Peterman, Fitchett, Mo, & Cella, 1999; Ehman et al., 1999; Roberts, Brown, Elkins, & Larson, 1997; see Pargament, 1997, for a comprehensive discussion of spiritual/religious coping). The concept of health itself has emerged in recent decades as something far more than just disease-free biological functioning. Health is powerfully influenced by cultural, social, and philosophical factors, including the existence of meaning and purpose in life and the quality of intimate personal relationships (Ornish, 1999; Ryff & Singer, 1998).

Such considerations have persuaded us that further investigation of spiritual/religious factors and health is both clearly warranted and clinically relevant. Many scientists nevertheless remain uninterested or uninformed about the existing literature linking spiritual/religious factors to health. We hope that the articles in this section will serve to stimulate interest in this topic.

There have been several grounds for opposition to the scientific study of spirituality. One philosophical basis for this perspective is materialism, the belief that there is nothing to be studied because spirituality is immaterial and beyond the senses (i.e., unempirical). Unlike most of the U.S. population, such scientific materialists reject the existence of anything beyond physical reality. From this vantage point, research on spirituality is simply a waste of scientific resources. Even from a materialist perspective, however, one might still be curious about how and why so many people develop and maintain religious beliefs and practices, and how these influence health (e.g., Targ, 1997).

A second possible reason for asserting that spirituality should not be studied is essentially the materialist argument in reverse: that is, science, by definition, is incapable of studying spirituality (e.g., Thomson, 1996). According to this view, the methods of science offer inept or inappropriate ways of trying to understand spirituality, regardless of its relevance to health and patient care. If one believes spiritual tenets to be fundamentally subjective and ineffable, then it follows that spirituality will elude methods that rely on direct observation and replication. There is integrity to this perspective, but again, it is a philosophical position and is not scientifically based.

Throughout its history, science has studied phenomena that were or are not directly observable but that could be inferred indirectly through predicted effects. A current example is string theory in the field of physics. This theory links general relativity theory and field quantum theory and has 11 dimensions, none of which have yet been observed (Taubes, 1999). Similarly, subjective states and latent constructs are increasingly common subjects of investigation in the social, behavioral, and biological sciences, as well as in the physical sciences (e.g., Dennett, 1991; Forman, 1998; Westen, 1998). We suspect that some features of spiritual experiences, broadly construed, may never be adequately captured by scientific methods. Yet much of spiritual experience can be studied in an empirically rigorous and sensitive fashion, especially by scientists working collaboratively with religious scholars and practitioners to

develop meaningful research (Barbour, 2000; Miller & Delaney, in press).

Some object to the use of public funds to study anything that smacks of religious factors in health (e.g., the Freedom From Religion Foundation, www.ffrf.org), sometimes citing the American principle of separation of church and state that prohibits Congress from making any law “respecting an establishment of religion, or prohibiting the free exercise thereof” (U.S. Constitution, Amendment I). This objection, implicitly a legal argument, contends that it is improper to use public funds for the scientific study of religious phenomena. No court has ever upheld such a proposition. To forbid research topics because they have a connection with religion would, in fact, seem to be an infringement of the very principle prohibiting the state from regulating matters of religion.

If the concern is that individual religious biases could unduly influence the conduct of science, a number of safeguards already exist for the plethora of potential biases that scientists bring to their work. Proposals submitted to the National Institutes of Health (NIH), for example, undergo a rigorous scientific peer review process to judge, among other factors, the proposal’s importance, methodology, innovation, feasibility, and cost effectiveness. Proposals to study spiritual and religious variables should be judged by criteria that are neither more nor less stringent than those for other proposals. The institutional review boards that are required of research institutions and agencies are mandated to safeguard the welfare of those participating voluntarily in research studies. Scientific journals impose a peer review process prior to publication of findings.

In summary, we believe that there is no scientific reason why spirituality and religiousness cannot or should not be studied. Scientists and others are, of course, entitled to differ in philosophically based opinions of the propriety and priority of such research. When taking a scientific approach, it is surely important to maintain objectivity in studying a topic that can touch on people’s most deeply held convictions. The secular authors of the classic volume *Persuasion and Healing* (Frank & Frank, 1991) observed that

practitioners of biomedicine generally refuse to take seriously the evidence that healing can occur through procedures involving the paranormal or supernatural. In seeking to maintain objectivity, we shall try to navigate between the Scylla of scornful skepticism and the Charybdis of gullibility. Too much skepticism may blind the observer to genuine phenomena that cannot be verified by standard scientific methods, while a too eager readiness to believe may lead to the acceptance of such flagrant frauds as Filipino “psychic surgery” (p. 88)

The authors of articles in this section have similarly sought to steer the careful course between these hazardous extremes.

The Emergence of Research on Religion and Health

Before the 1990s, the relationship between religion and health was largely a de facto area of research: Researchers

often buried religious variables in the methods and results sections of their studies without overtly highlighting them as legitimate areas of health research (e.g., by including them in article titles or abstracts). Somewhat simplistic religious measures have often been included as afterthoughts or exploratory variables in epidemiological studies, yet with surprising consistency, religious variables have been found to be significantly related to physical (Koenig et al., 2000; Levin, 1994, 1996; Plante & Sherman, 2001), mental (George, Larson, Koenig, & McCullough, 2000; Koenig, 1998; Larson & Milano, 1997), and substance use disorders (Gartner, Larson, & Allen, 1991; Gorsuch, 1995; K. Kendler, Gardner, & Prescott, 1997; Miller, 1998).

Rarely have researchers stated specific hypotheses about spiritual/religious measures, and often relatively strong predictive relationships have simply appeared in a table, without further mention or discussion (Larson et al., 1992). Although more sophisticated research has been conducted on how spirituality/religion affects mental health (George, Ellison, & Larson, in press; Hood et al., 1996), measurement of spiritual/religious constructs in health research has usually been poor in quality, often consisting of a single question, and spirituality has been narrowly conceived in terms of Western traditions of organized religion, primarily Protestant Christianity (Larson et al., 1998). Nevertheless, over time a substantial body of ad hoc and post hoc research findings bearing on the relationships between religion and health has gradually accumulated, and until recently, this literature had occasionally been collected in relatively obscure publications.

In the 1990s, however, this nascent area of research began to mature. The quantity as well as methodological quality of studies on religion and health improved markedly. Controlled investigations with formal hypothesis testing began to appear. Research initiatives were launched within NIH, including extramural programs of the National Institute on Aging, the National Institute on Alcohol Abuse and Alcoholism, and the National Center for Complementary and Alternative Medicine. Consensus panels of senior American scientists critiqued and discussed how to further strengthen research methodology and identified priority areas for future research on spirituality, religion, and health (Larson et al., 1998; National Institute on Alcohol Abuse and Alcoholism, 1999). Special issues and sections focusing on research on spirituality and health have appeared in scientific journals including the *American Journal of Physical Medicine and Rehabilitation* (Underwood-Gordon, Peters, Bijur, & Fuhrer, 1997), the *Annals of Behavioral Medicine* (Mills, 2002), the *Journal of Contemporary Criminal Justice* (Lucken, 2000), the *Journal of Health Psychology* (Thoresen & Harris, 1999), the *Journal of Marital and Family Therapy* (“Spirituality and Family Therapy,” 2000), *Psycho-Oncology* (Russak, Lederberg, & Fitchett, 1999), and *Twin Research* (Kirk & Martin, 1999).

This section of the *American Psychologist* contains a set of articles intended to stimulate, inform, and improve the quality of scientific research on spirituality, religion, and health. It represents one consensus product of the NIH

Working Group on Research on Spirituality, Religion and Health, convened by the Office of Behavioral and Social Sciences Research. These articles do not offer a comprehensive review of all pertinent research. Relatively little attention is given, for example, to the extensive literature on relationships of religion to mental health and addictions, which have been thoroughly reviewed elsewhere (e.g., Koenig, 1998). Instead, the articles focus on issues and methods to improve health research in this emergent field and suggest broad areas that appear promising for future investigation.

It is important to note that nearly all of the findings on spirituality/religion and health cited in this section come from research done in the United States. Therefore, the conclusions emerging from these reviews cannot be generalized to other populations. We hope, however, that these articles will encourage and assist colleagues to conduct methodologically sound research on spiritual/religious factors in health, both within and beyond North America.

In this introduction and overview, we provide some background for the articles that follow. In particular, we address four contextual issues: (a) definitions of terminology, (b) criteria used to judge the level of evidence currently supporting specific spiritual/religious hypotheses; (c) methodological approaches to statistical control in research on spirituality and religion, and (d) some recent critiques and concerns regarding religion and health. The section includes a methodologically conservative review by Powell, Shahabi, and Thoresen (2003, this issue), which summarizes epidemiological evidence linking religiousness to health outcomes and concludes that religiousness constitutes a unique protective factor at least in all-cause mortality, even after controlling for other accepted risk factors. Seeman, Dubin, and Seeman (2003, this issue) review evidence for possible biological pathways underlying a spirituality–health connection. Finally, Hill and Pargament (2003) discuss the large literature and recent advances in assessing spiritual/religious factors in research and practice.

Defining Spirituality, Religion, and Religiousness

The term *spirituality* has had a long and diverse career. William James (1902/1961) regarded religion as the “feelings, acts, experiences of individual men [sic] in their solitude . . . in relation to whatever they may consider the divine” (p. 42). Thus, in essence, he equated religion with spirituality and ignored institutional religion (Hauerwas, 2001). Simpson and Weiner (1991), in the *Oxford English Dictionary*, offer a substantial 10 pages of reference material on the concept of spirituality. Two related themes seem to dominate: First is the notion of being concerned with life’s most animating and vital principle or quality, often described as giving life or energy to the material human elements of the person. William James and others throughout the 20th century related the spiritual to a person’s character, personality, or disposition, often with an emphasis on the person’s social and emotional style and manner

of living (e.g., chronic anger or inner peace). Clearly human experience is central in understanding spirituality. Second, spirituality includes a broad focus on the immaterial features of life, regarded as not commonly perceptible by the physical senses (e.g., sight, hearing) that are used to understand the material world. Major religions have similarly used spiritual terminology to refer to that which is experienced and considered to be transcendent, sacred, holy, or divine (e.g., Holy Spirit).

Popular Usage

In popular usage, that which is spiritual is defined in diverse ways, usually in distinction from material reality as experienced by the physical senses (Thoresen & Harris, 2002). That which is spiritual is generally understood to transcend ordinary physical limits of time and space, matter and energy. Yet some features of spirituality are quite observable (e.g., spiritual practices, the spiritually motivated behavior of caring for others). Some view spirituality as primarily relational—a transcendent relationship with that which is sacred in life (Walsh, 2000) or with something divine beyond the self (Emmons, 1999). The concept itself is multidimensional and defies simple clear-cut boundaries. Therefore, it comes as no surprise that *spirituality* as a term tends to elude tight operational definition. It often seems easier to point to what spirituality is not (i.e., something material) than to what it is. In that sense, it shares some problems with latent (and overlapping) constructs such as character, love, well-being, peace, and health (cf. Levin, 2000; Oman & Thoresen, 2002).

We suspect that any scientific operational definition of spirituality is likely to differ from what a believer means when speaking of the spiritual. Scientists study beliefs or feelings or perceptions about spirituality, or they study behavioral practices and effects related to religion, all of which, from the believer’s perspective, are essentially physical manifestations that fall far short of representing or comprehending the real thing, the essence of what is experienced as spirituality. Although scientists frequently conceptualize and are interested in that which is not directly observable, scientific constructs are generally assumed to correspond, albeit imperfectly, to physically real entities. The believer, on the other hand, is surely not meaning anything like an underlying neurobiological event or structure when speaking of what is spiritual. This difference of meaning creates an inherent definitional if not a procedural tension in the study of spirituality.

What about *religion*? In one sense, religion is an institutional (and thus primarily material) phenomenon. Though often centrally concerned with spirituality, religions are social entities or institutions, and unlike spirituality, they are defined by their boundaries. Religions are differentiated by particular beliefs and practices, requirements of membership, and modes of social organization. What is spiritual or transcendent may be a central interest and focus, but religions are also characterized by other nonspiritual concerns and goals (e.g., cultural, economic, political, social). Thus, religion can be seen as fundamentally a social phenomenon, whereas spirituality (like health

and personality) is usually understood at the level of the individual within specific contexts (Thoresen, 1998). Viewed in this way, the field of religion is to spirituality as the field of medicine is to health.

Although religion is in this sense a social phenomenon, one can also conceptualize religiousness (or religiosity or even religion) at the level of the individual, as William James (1902/1961) did. A person can be described (or can describe himself or herself) as being *religious*, implying some form of adherence to beliefs, practices, and/or precepts of religion. Within this view, it is possible to conceptualize private as well as public forms of religiousness, and here the overlap with spirituality becomes evident. *Religiousness*, of course, is defined somehow in relation to religion, whereas spirituality—at least at the level of the person—may or may not be rooted in religion. This linguistic distinction allows for concepts that would once have seemed rather odd: unspiritual religiousness (e.g., religious attendance for its practical–social benefits) or unreligious spirituality (e.g., mystical experiences of individuals, which can be transforming or transcendent without religious context; May, 1982). Furthermore, religiousness may, for some persons, overlap substantially with spirituality, whereas for others, even within the same religion, there may be very little overlap. One can conceive of religion and its practices as either facilitating or inhibiting a person's spiritual development (Thoresen, Oman, & Harris, in press). Thus, spirituality and religiousness may be best described as overlapping constructs, sharing some characteristics but also retaining nonshared features.

Some studies of language usage illustrate this perspective. For example, Zinnbauer et al. (1997) surveyed 346 people in Pennsylvania and Ohio. Participants completed several questionnaires about perceived similarities and differences between religiousness and spirituality, as well as scales covering beliefs and attitudes about God, oneself, and others. Most commonly endorsed were the belief that religiousness and spirituality overlap but are not the same (42%) and the belief that spirituality is the broader concept and includes religiousness (39%). Few (10%) saw religiousness as the broader, more inclusive concept.

In another study, Woods and Ironson (1999) conducted semistructured interviews with 60 people who had serious medical illnesses (e.g., cancer, a myocardial infarction). The interviewers asked about participants' beliefs and behavior concerning spirituality and religion. Of the participants, 43% identified themselves as spiritual, 37% as religious, and 20% as both. These subgroups had much in common (e.g., belief in God or a higher power, belief in the importance of spirituality and/or religion in their overall lives), but significant differences were also found in participants' behavior and beliefs. For example, those identifying themselves as spiritual viewed God as more loving, forgiving, and nonjudgmental, whereas those regarding themselves as religious saw God as more of a judging creator.

Shahabi et al. (2002) recently found further support for this distinction. Although 52% of the 1,422 participants in their stratified national sample of adults (mean age =

45.6 years) viewed themselves as both spiritual and religious, roughly 10% described themselves as only spiritual, another 10% described themselves as only religious, and 28% identified themselves as neither spiritual nor religious. Those designating themselves as only spiritual were younger, more likely to be female, and more educated than the older and larger spiritual and religious group. Those identifying themselves as only religious were found to be more judgmental, more rigid in their beliefs, and more intolerant than all other groups, including those who were neither religious nor spiritual. In summary, the constructs of *spiritual* and *religious* do overlap in common usage, but can have significantly different meanings as well. It is also important to realize that the meanings of these words continue to evolve, with concepts of religion tending to become narrower over time, whereas those of spirituality tending to broaden (Pargament, 1999; Roof, 1993). The degree of distinction between these terms also varies across cultures; most research to date has focused on their usage in the United States.

Operational Definitions

Beyond the natural language issues, groups of scientists working toward operational definitions of *spirituality* or *religiousness* have agreed in at least one regard: These are complex phenomena (e.g., Larson et al., 1998; Pargament, 1997). Spirituality is not dichotomous: It is not an attribute that is either present or absent in an individual. Similarly, attempts to define spirituality as a single linear dimension (e.g., something that one has more or less of) are greatly oversimplified and often misleading. A broader understanding of spirituality or religiousness is one that can be used to characterize all individuals, regardless of their affiliation (or lack thereof) with any formal religion.

In the methodological language of behavioral sciences, spirituality and religiousness can be described as *latent constructs*—conceptual underlying entities that are not observed directly but can be inferred from observations of some of their component dimensions. Latent constructs, as noted earlier, are common in science, and indeed, often name the subdisciplines of behavioral sciences (e.g., cognition, culture, health, development, personality). Latent constructs are complex and usually multidimensional, with no single measure or dimension being likely to capture their essential meaning. Health, for example, is not just body temperature or blood pressure, and cognition is not limited to working memory or spatial relations, nor does intelligence concern only verbal reasoning.

Once one conceptualizes (from a scientific perspective) spirituality and religiousness as latent and multidimensional constructs, definitional issues may become clearer. What are the component dimensions that one would study to develop an understanding of these broad domains? How can one best operationalize these dimensions in replicable assessment methods? What issues determine whether a particular dimension or measure is regarded to be spiritual and/or religious? Although no scientific consensus yet exists on these issues, substantial progress has been made within the past few years, and

increasing attention (both public and scientific) is being given to the relationship between spirituality and health (Ellison & Levin, 1998; Koenig et al., 2000; Larson et al., 1998; Miller & Thoresen, 1999; Thoresen, 1999).

For this special section, religiousness and spirituality are regarded as distinguishable yet overlapping constructs. As discussed above, there are problems with either equating or separating these constructs, and for present purposes, they are discussed jointly in most contexts. Keep in mind two points, however: First, almost all empirical studies to date have not recognized the distinctions made above but instead have treated religiousness, religion, and spirituality as the same general concept. Although distinctions have been made, such as whether a religious practice or belief represents a more public form (e.g., attending services) or a more private form of spirituality/religion (e.g., prayer), studies have, in effect, treated spirituality and religiousness/religion as synonymous. Second, with rare exceptions, the available literature has measured religious (e.g., attendance of worship services) rather than spiritual variables. At present, the field lacks a body of well-designed studies of spirituality, as distinct from religion, and of its relationship to health (Thoresen & Harris, 2002).

A Levels-of-Evidence Approach

To provide some consistency of approach across reviews performed by the NIH working group, authors were asked to adopt a levels-of-evidence strategy in summarizing current scientific evidence in their area of review. The intent was to provide parallel standards of evidence across reviews, much as the literature review collaborations inspired by the British epidemiologist Archie Cochrane (e.g., Davoli & Ferri, 2000; see also <http://www.cochrane.org/cochrane/cc-broch.htm>) have sought to standardize criteria for evaluating efficacy trials across health areas, although clinical-trial criteria were not applicable for present purposes. Within the guidelines provided to authors, level of evidence is a concept that applies to a particular proposition or hypothesis. Because it is difficult to apply clear evidence rules to high-level abstractions, such as the effect of spirituality on health, authors were asked to review the empirical evidence for more specific propositions: What hypotheses have been directly or implicitly proposed in the area being reviewed, and how strong is the evidence for each of them?

What constitutes a proposition necessarily varies across these articles. Hypotheses were most obvious for the reviews of causal mechanisms (George et al., in press; Seeman et al., 2003). Most hypotheses involved spiritual/religious constructs on one side of a proposition and health variables on the other. As research progresses in the field, the degree of specificity can be increased on both sides of such propositions. Given the present state of the field, however, it was usually necessary to maintain a higher level of abstraction on at least the spiritual/religious side of the proposition (e.g., religious involvement predicts subsequent risk of mortality from cardiovascular disease).

The choice of propositions around which to organize a review was an important process for each author, and in

some cases, such organization was found to be infeasible (e.g., Hill & Pargament, 2003, this issue). Once the propositional structure for the review had been decided, the authors proceeded to review the empirical evidence pertinent to each and to assign the propositions to categorical levels of evidence. A first step was to classify studies that supported or did not support each assertion. The guideline provided to authors was that each study was to be classified into one of three categories.

1. The studies in Category A were published in peer-reviewed scientific journals. The methodology of the studies (including statistical analyses) was judged by reviewers to be sufficiently sound to support conclusions about their assertions. (This is not to say, however, that any study alone provides conclusive evidence for a proposition.) The studies' conclusions may be either positive (A+ = *supporting the proposition*) or negative (A- = *not supporting the proposition*).

2. In Category B, the methodology of the studies (including statistical analyses) was generally sound, but the reviewers identified at least one important methodological limitation that clouds interpretation of the studies' findings about their propositions. The studies' findings are published (or are at least in press), but they may or may not appear in a peer-reviewed scientific journal (e.g., they might be reported in a book chapter). The studies' conclusions may be either positive (B+ = *supporting the proposition*) or negative (B- = *not supporting the proposition*).

3. In Category C, the methodology of the studies was judged by reviewers to be sufficiently flawed that no conclusion about the proposition could be reasonably drawn. Because of their poorer methodology, these studies were not classified as being positive or negative in valence, but only as C studies.

Note that the term *conclusions* here refers to the reviewer's conclusions based on data that were presented in the study. It is not uncommon for findings on religion and health to be reported (e.g., within a table) but not interpreted or commented on by the authors of the study.

The accumulation of studies, in turn, led to these provisional definitions of four levels of evidence for each proposition:

1. To reach the level of *persuasive evidence* (with a rating of 3), at least three Category A studies (or at least five studies from Categories A and B) must have reported a statistically significant relationship that is consistent with the hypothesis (i.e., they have A+ or B+ ratings). The studies must not all be from the same group of investigators. The presence of other negative studies (with A- or B- ratings) does not logically prevent an assertion from falling into this category.

2. To reach the level of *reasonable evidence* (with a rating of 2), two Category A studies (or three to four studies from Categories A and B) must have reported a statistically significant relationship that is consistent with the hypothesis (i.e., they have A+ or B+ ratings). The studies may be from the same group of investigators. The presence of other negative studies (with A- or B- ratings)

does not prevent an assertion from falling into this category, even if negative studies outnumber positive studies.

3. To reach the level of *some evidence* (with a rating of 1), at least one Category A study (or at least two Category B studies) must have reported a statistically significant relationship that is consistent with the hypothesis (i.e., they have A+ or B+ ratings). The presence of other negative studies (with A- or B- ratings) does not prevent an assertion from falling into this category, even if negative studies outnumber positive studies.

4. The level of *insufficient evidence* (with a rating of 0) is present when current evidence does not meet criteria for even a rating of 1.

Note that an accumulation of statistically significant effects contrary to a proposition would be construed as evidence for an opposite proposition. Thus, if one were examining evidence on the proposition that religious involvement is associated with decreased risk of thoracic cancers and one found a series of Category A studies showing the opposite, the proposition would typically be reworded to reflect the findings: Religious involvement is associated with increased risk of thoracic cancers. This prevents confusion among three different kinds of lack of support for a proposition: (a) the presence of well-designed studies showing an opposite effect, (b) the presence of well-designed studies showing no effect (reflected as A- and B- studies), and (c) the absence of well-designed studies. This makes it logically possible, within this system, for two opposite propositions both to be classified as supported by persuasive evidence (i.e., to have a rating of 3). Because it is logically impossible to prove the null hypothesis, we focused on levels of evidence for specific assertions.

Interpreting the Scientific Literature: Two Approaches to Statistical Control

Research on spirituality/religion and health crosses many disciplines and areas of specialization. Scientific disciplines often use different approaches in the design of studies and analysis of data. The same body of research can lead to quite different conclusions, depending on the qualitative or meta-analytic strategy used to distill findings. One area of diversity is in statistical control of spiritual/religious variables in health research (an issue not unique to this area, of course). We contrast two different approaches to statistical control as a context for the articles that follow. Depending on which of these approaches one adopts, it would be possible to reach quite different conclusions about the relationship between spirituality/religiousness and health.

Unique Variance Approach

A unique variance approach focuses on risk and protective factors. In a conservative epidemiological strategy, a new factor is required to significantly improve the ability to predict a health outcome, above and beyond already-recognized risk factors. In predicting the occurrence of heart disease, for example, one might first enter accepted risk

factors such as gender, age, family history, socioeconomic status, cigarette smoking, weight, stress, diet, and exercise. To be considered important, a new factor (such as religious involvement) must significantly improve prediction above and beyond the contribution of such known risk factors. If the new factor does not account for significant additional unique variance, it is judged not to be an independent risk factor and, in some circumstances, is described as *spurious*. This is the approach taken by Powell et al. (2003). After summarizing the broad literature on the strength of bivariate relationships between spiritual/religious factors and health, the authors attempted to make the bivariate relationship go away by removing variance shared by religiousness and currently accepted risk factors. Using this conservative approach, they concluded that religiousness does constitute, in general, an independent risk (protective) factor, particularly in predicting all-cause mortality (cf. Koenig et al., 2000; Oman & Reed, 1998).

Causal Modeling Approach

A unique variance approach does not take into account possible causal relationships among factors that share common variance. Psychologists are usually more accustomed to thinking in terms of hypothesized causal linkages. If predictor X (in this case, a spiritual/religious variable) is entered after one or more other predictors (Z_1, Z_2, Z_3 , etc.) and still accounts for additional unique variance in health outcome Y (e.g., all-cause mortality), then one can reasonably conclude that the relationship between X and Y is not due exclusively to variance that is shared between Y and the Z variables. If, on the other hand, X no longer contributes unique variance to the prediction equation, it cannot be logically inferred that the relationship of X to Y is irrelevant or spurious or that it is due to or explained by Z . To do so is to invoke the covariance fallacy, which is a special case of the confusion of correlation with causation. If the Z predictors share common variance with the X and Y variables, then the entry of each Z predictor removes some of the relationship between X and Y . Although it is possible that this common variance is causally attributable to Z , it is equally plausible that it is attributable to X or to some third factor that influences both X and Z but was not included in the model. By entering enough correlated predictor variables, one can make even clearly causal relationships disappear (cf. Koenig et al., 1999).

An example may be helpful here. Suppose that one wishes to determine whether there is a causal relationship between cigarette smoking (X) and the incidence of cancer (Y). The bivariate relationship between X and Y is strong and consistent, but how are they linked? One way to go about this task is to come up with a list of potential confounders (Z_1, Z_2, Z_3 , etc.) and enter them first as predictors of Y in a regression model. These might include gender, ethnicity, current health status (including asthma and other respiratory illnesses), depression, level of alcohol use, marijuana smoking, personality variables (such as risk taking), religiousness, exercise level, diet, body weight, and socioeconomic status. In either a cross-sectional or a longitudinal design, these Z predictors are entered first and

account for a substantial proportion of variance in cancer incidence. Then smoking (X) is entered and might or might not be found to yield a significant increment in R^2 . If it does not, the covariance fallacy would be to conclude that cigarette smoking therefore does not contribute to cancer. In fact, which variables account for outcomes in a unique variance approach is highly dependent on the order in which predictors are entered into the regression equation (Thoresen & Harris, in press). It is also important to distinguish true confounders (appropriate covariates) from potential mediators or moderators of effect. If the latter are entered as covariates, the result can be a misleading reduction in the strength of a true causal relationship (cf. Koenig et al., 1999).

A longitudinal design can provide stronger support for causal linkages but still offers no protection against the covariance fallacy in interpreting findings. Brown and Miller (1993), for example, found in a randomized clinical trial that offering a single session of motivational interviewing (X) at Time 1, prior to a 21-day inpatient alcoholism treatment program, was associated with a doubling of the abstinence rate (Y) at Time 3 (3 months after discharge). At Time 2 (discharge from treatment), program therapists, who were unaware of group assignment, rated patients who had received motivational interviewing as more actively involved in treatment during their inpatient stay. The investigators tested a mediational model, entering therapist ratings of motivation as a covariate (Z) and found that X (intervention: motivational interview vs. none) no longer predicted Y (treatment outcome). The covariance fallacy here would be to conclude that the intervention had no causal effect on outcome (abstinence rate) or that the intervention impacted abstinence indirectly because it caused patients to be more actively involved in their treatment. This may be so, but it is also quite possible that the effect of the X would have occurred even without the intervening period of inpatient treatment. The fact that Z occurred temporally in between X and Y does not, in itself, render it a necessary causal link.

A recent study by Ironson et al. (2002) further illustrates this issue. In a longitudinal study of HIV/AIDS survivors, they found that each component of a composite religiousness index was associated with longer survival. Testing a priori hypotheses about religiousness and reduced urinary cortisol, serving others in need, optimism, and several health behaviors, they found that the relationship of religiousness to survival was directly mediated by cortisol levels and by serving others but not by optimism. That is, the relationship of religiousness to survival was no longer significant once cortisol level was taken into account. The direct effect of religiousness was also removed by taking into account the serving of others. Does this mean that the effect of religiousness was explained away by cortisol levels (or by serving others) and that it should be ignored? Not necessarily. Religiousness may have influenced other factors that affected both cortisol levels (or serving others in need) and other important risk variables. For example, the religiousness component "sense of peace" (i.e., items about comfort, strength, meaning in life, feeling a connec-

tion, less aloneness, and existential beliefs about death and an afterlife) was negatively related to cortisol levels ($r = -.27$), smoking ($r = -.43$), perceived stress ($r = -.28$), and hopelessness ($r = -.48$) and was positively related to safer sexual practices ($r = .25$).

This illustrates the covariance fallacy as a possible hazard in testing mediational models. If one finds that Z does not mediate the relationship between X and Y , then one can confidently conclude that X does not have to go through Z in order to produce Y . The inverse, however, does not hold logically. The finding that Z does mediate the relationship of X to Y is not in itself evidence that X must or even does lead to Y indirectly, through its influence on Z . That is one possible interpretation of the observed pattern of covariance, but other explanations are also plausible. For example, Z may be an ancillary effect of X , and even if Z is correlated with Y , it is not necessarily part of the causal chain.

Another example may be helpful. Suppose that those who experience therapeutic benefit from a medication are also likely to report a particular side effect (e.g., nausea), whereas those who do not benefit are less likely to experience the side effect. In this case, the side effect mediates (in a statistical sense) the relationship between medication and outcome. The medication (X) produces both the side effect (Z) and the therapeutic benefit (Y), yet the side effect probably does not cause (i.e., is not a necessary or sufficient condition for) the benefit to occur.

This suggests the need for a second type of analysis when risk factors covary. Statistical methods such as path analysis and structural equation modeling allow for the disaggregation of direct from indirect effects (those exerted through a third variable), although one must remember that these effects are still covariances and do not demonstrate causality. This departs from the practice of entering risk factors in the order in which they were discovered and, instead, considers them simultaneously in the context of one another, in order to model how they may interact in leading to health outcomes. In this view, controlling for a variable should be done in the context of some notion of causal sequences or hierarchies among the variables involved, and it can be more informative when done in discrete steps (for building or testing models). Controlling for a variable in the absence of a conceptual model can be useful when addressing the issue of statistical independence but provides less information about the nature of the relationships among the variables.

In another review emerging from the NIH working group examining research on religion/spirituality and health, George et al. (in press) reviewed research on psychosocial mediators of religion–health relationships and concluded that most of the shared variance between religiousness and health is not accounted for by potential mediating factors such as stress, social support, and health behaviors. Seeman et al. (2003) offer a similar analysis of potential biological mediators of spirituality–health linkages. Surprisingly few studies have included adequate measures of potential mediators of relationships between health and spiritual/religious factors.

Some risk and protective factors are important because of the manner in which they interact with other variables. This can occur, for example, when the relationship between X (a predictor variable, such as religious attendance) and Y (a health outcome, such as coronary disease risk) is different depending on the categorical level of a third variable, M (such as gender). At one level of M (e.g., for male participants), the relationship between X and Y is positive and direct. At another level of M (e.g., for female participants), the relationship between X and Y may be absent, inverse, or more complex (e.g., curvilinear). Such M factors are traditionally referred to as moderator variables. The level of M provides an important context within which to understand the relationship of X to Y . For example, women have been found to benefit more than men do from attending religious services and from volunteering to help others (Oman, Thoresen, & McMahon, 1999; Strawbridge, Shema, Cohen, & Kaplan, 2001). Chatters (2000), another participant in the NIH working group, provided a valuable perspective on the often-ignored moderating effects of contextual factors (such as ethnic and cultural background) on health. The importance of a risk factor such as spirituality/religiousness, including the magnitude and direction of its effect on health, may vary widely across ethnic groups that differ with regard to the cultural centrality of religion.

Finally, spiritual/religious variables may themselves mediate or moderate the relationships between illness and other variables, such as life stressors and quality of life. Physical well-being is a well-established component of quality of life; as physical well-being decreases, other aspects of quality of life also tend to decline. Brady et al. (1999), however, found that religiousness constituted a unique predictor of quality of life, contributing variance not accounted for by potential confounders. Furthermore, they found that religiousness buffered the relationship between physical well-being and overall quality of life, such that people higher in religiousness reported substantially greater enjoyment of life, regardless of the presence or absence of physical symptoms such as pain and fatigue. Such data strongly suggest that the role of spiritual/religious factors in overall health cannot be fully understood by examining only physical health or disease outcomes.

Criticisms and Concerns About Religion and Health

Concern for Adverse Effects of Religion on Health

Discussion of the relationship between religion and health has not been without serious concerns and critics. Religious beliefs and practices are commonly criticized for their potential negative effects on health and well-being. Such criticisms are often illustrated by persuasive examples. For decades, almost anything religious was labeled within psychology as unscientific, if not pathological (Ellis, 1986; Freud, 1927/1961). Not until the publication of the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)*; American Psychiatric Association,

1994) were spiritual/religious problems officially recognized as normal developmental issues. Anecdotal evidence is often used to illustrate how religion can be associated for some persons with negative effects including guilt and anxiety, excessive dependency, depression, cognitive inflexibility, and intolerance. More spectacular or disturbing examples become news: the mass suicide at Jonestown, sexual abuse by clergy, or parents refusing on religious grounds to accept medical services for their children (Koenig et al., 2000; Plante, 1999).

In the spirit of two-tailed tests, clearly research on religion should examine both its positive and its negative potential effects on health. Certainly misuses and abuses exist within religion, as they do in any significant social institution. Apart from such distortions of religion, however, it is entirely possible that certain religious beliefs or practices are associated with adverse health effects. At present there is no substantial base of empirical evidence regarding negative effects of religion on health (Thoresen et al., in press). If research on health benefits of religion has been widely avoided within mainstream psychology, well-designed studies of its potential adverse effects appear to have been even more shunned. Whatever the directional hypotheses in research on religion and health, it is appropriate to design studies to detect both beneficial and adverse potential effects. We concur with Barbour's (2000) perspective that science and religion can best work together in dialogue, both in understanding health effects of religion and in reducing abuses and misuses of religious beliefs and practices.

Methodological Critiques

In a series of publicized articles, Sloan and colleagues have criticized the quality of research linking religious factors to health (e.g., Sloan & Bagiella, 2002; Sloan, Bagiella, VandeCreek, Hover, & Casalone, 2000). One broad thrust of their argument, which is not without merit, concerns the research methodology that has been used. They characterized the empirical evidence linking religiousness to health as flawed and as leading researchers to often inappropriately interpret correlational findings as demonstrating that religiousness caused better health status. Their criticisms included misuse of statistics, inappropriate designs, inadequate sampling, post hoc findings of studies not primarily about religiousness, and failure to demonstrate that religious factors demonstrated a unique main effect (consistent with the unique variance approach described above). Such criticisms are an important part of the method by which science progresses and promote vigilance against bias in research.

It is, of course, quite easy to find inherent flaws in single studies. Science proceeds not primarily through isolated studies, but through patterns of replication. Here we are impressed by the sheer volume and consistency of evidence, albeit mostly correlational at present, pointing toward salutary effects of religion on health. Although protections against Type I errors are vital, it is likewise important to avoid Type II errors. We disagree with Sloan and colleagues' (e.g., Sloan & Bagiella, 2002; Sloan et al.,

2000) wholesale dismissal of a very large research literature and with their related assertion that there is no scientific basis for a link between religious factors and health (cf. Weaver, Flannelly, & Stone, 2002). We concur instead with Smith (2001) that the evidence is clearly suggestive and, though not definitive or conclusive, is sufficient to warrant further methodologically sound investigation that will clarify health risk or protective effects of spiritual/religious factors.

Much of the current evidence for linkage comes from epidemiological studies with general populations, and risk or protective factors do not automatically translate into effective interventions. The relationship of religiousness to health outcomes may be quite different for generally healthy individuals versus those with specific diagnoses. There is relatively little published research on religiously based prevention and treatment interventions, and studies are much needed in this area.

Concern for Misuse in Practice

A second legitimate issue raised by Sloan et al. (2000) and others (e.g., Lawrence, 2002) regards potential abuses by professional health care providers when addressing religious factors in practice. Sloan et al. cited a litany of possible harms and abuses: the coercion of patients by physicians, given their powerful status, invasion of privacy, and the threat of religious discrimination or proselytizing by which some professionals may impose their own religious orientations on patients. Although such abuses can occur and are clearly of concern, no scientific evidence is offered to document disproportionate occurrence of such events related to religion (as compared with other potential grounds for discrimination and abuse, including gender, age, ethnicity, sexual preference, and economic or political factors). As with any professional endeavor involving a sensitive topic, issues of ethical conduct are of prominent concern to psychologists, but we do not believe that they uniquely adhere to research on spirituality and religion.

Summary

Substantial empirical evidence points to links between spiritual/religious factors and health in U.S. populations, although the processes by which these relationships occur are poorly understood, and evidence is sometimes exaggerated. Methodologically sound research on linkages among spirituality, religion, and health is warranted, feasible, and timely. It can be useful in health research to distinguish spirituality from religion, and much more research has been done on the latter than on the former. A wide range of psychometrically sound instruments is available for measuring spiritual/religious variables in research and can be included in larger health studies at minimal cost. Rigorous prospective hypothesis-testing research is also needed to clarify the extent to which and the means by which spiritual and religious factors influence health.

Here is a genuine frontier for research, one in which psychologists have both much to offer and much to learn (Miller & Delaney, in press). It is a topic that already

enjoys high public interest. Most people want to live with better health, less disease, greater inner peace, and a fuller sense of meaning, direction, and satisfaction in their lives. Increasing levels of affluence and materialism have failed to bring such changes (Myers, 2000). Scientific investigation of this neglected aspect of human nature may lead to important new clues for helping people live together with better health, richer positive experiences, and greater meaning and satisfaction in life.

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