

Explaining the Relationships Between Religious Involvement and Health

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There is increasing research evidence that religious involvement is associated both cross-sectionally and prospectively with better physical health, better mental health, and longer survival. These relationships remain substantial in size and statistically significant with other risk and protective factors for morbidity and mortality statistically controlled. In this article, we review the social and psychological factors that have been hypothesized to explain the health-promoting effects of religious involvement. The four potential psychosocial mechanisms that have received empirical attention are health practices, social support, psychosocial resources such as self-esteem and self-efficacy, and belief structures such as sense of coherence. Evidence concerning these potential mediators is mixed and inconsistent, suggesting there is more to be learned about the pathways by which religion affects health. Other possible explanations for the salubrious effects of religious involvement on health and longevity are discussed.

Many scholars have offered hypotheses about the relationship between religious involvement and health, especially mental health. These hypotheses take a variety of forms, including expectations that religious participation will benefit health, harm health, and be unrelated to health. There is increasing, albeit not universal, evidence that religious involvement is associated with better physical and mental health and longer survival. Evidence supporting this conclusion emerges from (a) both cross-sectional and longitudinal studies, (b) studies based on both clinical and representative community samples, and (c) studies examining a variety of health outcomes (for reviews, see George, Larson, Koenig, & McCullough, 2000; Levin 1994).

Given the accumulating evidence that religious involvement is or can be beneficial to health, a critical next step is to identify the processes and mechanisms by which religion exerts its salubrious effects. This is important for at least two reasons. First, of course, is the scientific tenet that research is not complete until observed relationships have been explained. Second, identifying the mechanisms by which religion affects health may be of practical value. Religion is not universally palatable. If, however, the “active ingredients” by which religion promotes health can be established, it may be possible to provide them in ways that are acceptable to people unwilling to participate in religion.

The purpose of this article is to examine the hypothesized mechanisms by which religion affects health and the extent to which empirical evidence supports those hypotheses. First, however, it is necessary to provide background information about the research base that underlies these efforts and its implications for causal inferences.

Research on Religion and Health: What It Does and Does Not Tell Us

As noted previously here, a large and growing body of research reports significant positive associations between religious involvement and a variety of health outcomes. Space limitations preclude a review of that broad body of research, but several facets of it merit attention: dimensions of religious participation, the nature and quality of the samples, the extent to which the positive relationship between religion and health remains with potential confounders statistically controlled, and evidence about the potentially harmful effects of religion on health.

Dimensions of Religious Involvement

Religious participation takes a variety of forms. In a recent report, a group commissioned to review the mea-

surement of religion identified 10 dimensions that might be expected to affect health (National Institute on Aging/Fetzer Institute Working Group, 1997). Empirically, research to date has focused primarily on four dimensions: (a) public participation (attendance at religious services and related activities, e.g., study groups), (b) religious affiliation (major religious groups and/or specific denominations), (c) private religious practices (e.g., prayer, meditation, reading religious materials), and (d) religious coping (the extent to which individuals turn to religion when coping with problems). Correlations among these dimensions tend to be positive but of modest magnitude and variable statistical significance.

Although all four dimensions have been linked to positive health outcomes, they are not equally powerful. Two dimensions stand out in this regard, albeit in very different ways. First, attendance at religious services is most strongly related to physical health, mental health, and mortality in community-based samples (e.g., Ellison, 1995; Koenig, George, Cohen, et al., 1998; Koenig et al., 1999). Thus, people who attend religious services once a week or more typically have fewer illnesses, recover more quickly from illness, and live longer than individuals who attend less frequently. Second, in studies of illness course and outcome, based on clinical samples, religious coping is the most powerful predictor of recovery and survival (e.g., Oxman, Freeman, & Manheimer, 1995; Pargament, 1997). That is, persons who report relying on their religion to help them cope with illness tend to recover more quickly from illness and better tolerate invasive medical procedures (e.g., coronary bypass surgery). They also are more likely to survive serious illness. Thus, efforts to identify the mechanisms by which religion affects health need to take into account the differential importance of religious dimensions for specific health outcomes.

Nature and Quality of Samples

As might be expected, a wide range of sampling strategies has been employed in studies of religion and health, ranging from convenience samples to representative samples of both specific geographical areas and the United States as a whole. In the last few years, the number of studies based on representative community-based samples has grown dramatically. The relationships between religious involvement and health observed in those samples are as strong—and often stronger—than those observed in lesser quality samples.

The quality of clinical samples is even more variable than that of community samples. Clinical samples usually consist of patients with specific diseases who originate in a single health care setting (e.g., a specific clinic or hospital). Because of the heterogeneity of diseases and settings, it is impossible to know whether

discrepancies across studies are “real” or an artifact of sample characteristics. Only two studies have examined the effects of religious participation on the course and outcome of mental illness (Koenig & George, 1998; Koenig, George, & Peterson, 1998), and the (separate) samples in these studies were restricted to older patients hospitalized for physical illness.

Two other sampling patterns merit note. First, more than half of the studies that address the relationship between religion and health are based on samples of older adults (i.e., age 60–65 and older). In one sense, this is advantageous because it is only in middle and, especially, late life that the risks of developing chronic illness and of dying are sufficiently great to perform meaningful analyses. On the other hand, the generalizability of the research base is limited by the preponderance of studies of older people. Second, there are likely to be regional differences in rates of religious participation (e.g., the southern “Bible Belt” as compared with the Southwest or Northeast), although these differences do not mean that the relationship between religion and health differs by region. Comparisons across studies performed in different regions do not suggest systematic regional differences in the relationship between religion and health. Nonetheless, empirical tests would be more compelling—and are rarely included in studies based on national samples.

Control of Potential Confounding Variables

Convincing evidence of a robust relationship between religious involvement and health requires that the relationship remains substantial in size and statistically significant when other risk factors for morbidity and mortality, especially those that also are correlated with religion, are taken into account. Based on our knowledge of the psychosocial factors most strongly related to health, the ideal set of covariates would include standard demographic factors, socioeconomic status, and social stress. In studies of mortality, measures of health status are also critical covariates. Moreover, most of these variables are significantly associated with religious involvement as well as health and mortality. Recent studies typically include most of these variables, and there is strong evidence that the relationship between religious involvement and health outcomes remains sizeable and significant, albeit smaller than in bivariate analysis, with relevant covariates statistically controlled (e.g., Braam et al., 1998; Hummer, Rogers, Nam, & Ellison, 1999). This is important for purposes of identifying the mechanisms by which religion affects health because there would be no purpose to such efforts if the relationship between religion and health is spurious.

Can Religion Harm Health?

This article focuses on the mechanisms by which religion promotes health and longevity, and this is compatible with the majority of research evidence to date. Nonetheless, it is worth addressing the issue of the potentially health-damaging effects of religious involvement. The research reviewed later here is primarily based on large-scale social or epidemiologic surveys—plus a small number of studies based on clinical samples. The strength of the social surveys is their sophisticated sampling strategies, which yield representative samples of defined geographic areas. A less attractive corollary of those sampling designs is that deviations from the patterns that best describe the samples will be unobserved. Thus, although it is probable that religious involvement is damaging for a small proportion of individuals, research results elucidate the patterns that best describe the samples as a whole. Some psychological and psychiatric studies describe persons who appear to have been harmed by religious participation or beliefs, although those studies rely on either case studies or small clinical samples. There is no contradiction between the results of the studies reviewed here, which indicate that religious participation is beneficial for health, and the findings of mental health professionals who have observed the opposite. Rather, they describe different segments of the population, although religion has either no effects or positive effects on health for most people.

The very limited evidence that religion can harm health that has emerged from surveys and from large clinical samples takes two forms. First, religions that preclude their members from seeking medical care appear to exact a price in longevity. One study reports that Christian Scientists die at younger ages, on average, than the general population (Simpson, 1989). Although this finding is not surprising because Christian Scientists do not believe in seeking medical care, this study has numerous methodological flaws. Another epidemiologic study documents the prevalence of childhood deaths resulting from religiously motivated medical neglect (Asser & Swann, 1998). Second, and much more impressive, is evidence that there are both “positive” and “negative” forms of religious coping—a distinction proposed by Pargament (1997), who has also studied positive and negative religious coping extensively. Positive religious coping is characterized by faith in God (or a higher power); the belief that God loves, cares for, and strengthens one; and the sense that one is working with God to manage and cure illness. Negative religious coping is characterized by feeling punished or abandoned by God, believing that illness is a result of sin, and similar cognitions. Substantial evidence suggests that positive religious coping is associated with better illness course and outcome and that negative religious coping has the opposite effect, espe-

cially with regard to increasing depression and anxiety (e.g., Koenig et al., 1992; Pargament, 1997). Moreover, religious coping has significant effects on health over and above those exerted by nonreligious forms of coping (e.g., Pargament, 1997).

How and Why Does Religion Benefit Health?

The central issue of current concern to social and behavioral scientists studying the relationships between religious involvement and health is identifying the mechanisms by which religion benefits health. Thus far, efforts to discover how and why religion benefits health have focused on identification of mediators that can explain, in part or in total, the religion–health relationship. Four major categories of mediators have been examined to varying degrees and with varying success. Each are reviewed here in terms of both the theoretical rationale for positing a mediating relationship and empirical findings.

Clearly, the purpose of identifying the mechanisms by which religion benefits health is an effort to make causal inferences, despite the inability to use experimental designs that provide the most compelling evidence of causality. Consequently, this review is largely restricted to longitudinal studies in which the effects of religion and its potential mediators on health are studied prospectively, with relevant controls of baseline health. Unless otherwise noted, all of the studies cited in this section employed longitudinal data.

It also should be noted that the volume of studies investigating the mediators of the relationship between religion and health remains small. Although more than 400 studies report significant relationships between religious participation and health (Koenig, 1997), only a few have examined the potential mediators of this relationship. As a result, there is a total absence of studies examining some combinations of specific dimensions of religious involvement and specific health outcomes, and indeed, we cannot make definitive conclusions about any specific combination of religious involvement and health outcome. Thus, the evidence to date can be viewed only as initial efforts to trace the pathways by which religion influences health.

Health Practices

One possible mechanism by which religion benefits health may be via health practices. The rationale for this hypothesis is that religious participation promotes good health habits that, in turn, have positive effects on health and longevity. There are two major reasons why religious participation might be expected to increase the likelihood of health-protecting and health-promot-

ing behaviors. First, and most obvious, some religious faiths explicitly prescribe good health habits. This is most true of the Mormon religion, which prohibits smoking, alcohol, and sex outside of marriage, as well as providing guidelines for diet, amount of sleep, and time spent with family. Although the Mormon religion has the most codified and monitored set of health practices, other religions also have strict rules about health habits (e.g., Seventh Day Adventists and Black Muslims). Second, it is likely that most, if not all, religions teach their members to respect and take care of their bodies. Many religious organizations adhere to the tenet that “the body is the temple of the soul” (or similar beliefs), and gratitude for good health and the gift of life is an integral part of many religions.

Although the research base is small, health practices have been shown to explain most of the relationship between religious affiliation/denomination and health when religions that have explicit prescriptions and proscriptions about health behaviors are compared to members of other religions, persons who are not affiliated with a religious tradition, or both. Phillips, Kuzma, Benson, and Lotz (1980) compared Seventh Day Adventists and members of other religions with regard to health habits and, subsequently, cancer and cardiovascular mortality. Although the strength of the mediating effects differed across diagnoses, the general pattern was that Seventh Day Adventists had lower mortality than members of other religions, and this was partially explained by their better health habits. Gardner, Sanborn, and Slattery (1995) compared rates of cervical cancer between Mormon and non-Mormon women in Utah. They reported substantially lower rates of cancer among Mormon women; nearly all of this difference was explained by differences in smoking and sexual behavior between the two groups. Although these findings are important, they are of limited generalizability, applicable only to comparisons of religious traditions that include explicit attention to health habits to other religious traditions. Moreover, this is the *only* area for which affiliation/denomination has been shown to have any significant relationship to health outcomes. Other religious traditions are comparable in the health benefits enjoyed by their members.

Health practices also partially mediate the effects of attendance at religious services on a variety of health outcomes. Specifically, health practices partially explain the effects of service attendance on mortality, over intervals ranging from 3 to 28 years (Hummer et al., 1999; Oman & Reed, 1998; Strawbridge, Cohen, Shema, & Kaplan, 1997)—although two other studies find that health habits are independent predictors of mortality but do not mediate the relationship between service attendance and mortality (Koenig et al., 1999; Koenig, Larson, et al., 1998—these studies are based on different samples). Health practices also have been reported to mediate partially the effects of service at-

tendance on disability (Idler & Kasl, 1992) and depressive symptoms (Idler, 1987; Musick, Blazer, & Hays, 2000).

Thus, the research base concerning the mediating effects of health practices is small but promising. There is strong evidence that health behaviors largely mediate the relationships between religious affiliation and specific health outcomes. In representative community samples, health practices partially mediate the effects of religious service attendance on several health outcomes, although the findings are not universal. One reason that the research base is small is that this review was restricted to longitudinal studies. Similar results have been reported in several cross-sectional studies (e.g., Idler, 1987; Wallace & Forman, 1998). Indeed, the mediating effects of health practices appear to be somewhat larger in cross-sectional than in longitudinal studies. One advantage of longitudinal studies is that selection effects are at least partially taken into account. It is plausible that favorable health practices increase the likelihood of attending religious services (the selection hypothesis), just as it is plausible that attending religious services promotes healthy behaviors (the social causation hypothesis). Although the mediating effects of health practices are somewhat smaller in longitudinal than in cross-sectional studies, the estimates are likely to be more accurate because at least part of the effects of social selection have been excluded. It should be noted, however, that two recent longitudinal studies report that the onset of disability is *not* followed by lower frequency of religious service attendance (Goldman, Korenman, & Weinstein, 1995; Idler & Kasl, 1997). These studies suggest that health may not be a significant determinant of public religious participation.

There are several priority issues for future research on this topic. First, research investigating the potential mediating role of health behaviors for other dimensions of religious involvement and for a broader range of health outcomes is needed. Second, studies that compare specific congregations would help to elucidate the dynamics of religious involvement, health behaviors, and health outcomes. Beyond denominational differences, religious congregations undoubtedly vary in the extent to which there is focused attention on health and health behaviors (e.g., teen programs that discourage the use of alcohol and cigarettes, church-based sports teams). It would be useful to know whether the health behaviors of congregations that focus on health issues are better than those of congregations who focus on other issues. Third, one of the difficulties in measuring the effects of health practices on health outcomes is that poor health behaviors often take many years to exert demonstrable negative effects on health. Therefore, studies that examine long-term patterns of religious participation and health practices would also provide important information about health

practices as a pathway by which religious involvement affects health.

Social Support

Social support also has been hypothesized to mediate the effects of religious involvement, especially attendance at religious services, on health outcomes. Thus, one of the consequences of religious involvement may be access to and opportunities to develop social ties with more people with whom one shares a worldview than are available to nonreligious persons, and those higher levels of social support may promote better health and longer life among religious persons. It is certainly well-established that social support often exerts powerful protective effects on health (e.g., House, Landis, & Umberson, 1988). The hypothesis that social support mediates the relationship between religion and health also is compatible with the finding that attendance at religious services is the most powerful predictor of health and mortality. Attending services undoubtedly increases the likelihood of developing social networks and support systems more than private devotions or religious coping.

Again, the research base is far from comprehensive with regard to testing the extent to which social support mediates the relationship between religious involvement and health. In addition to the four major dimensions of religious participation and the wide range of relevant health outcomes, social support also is a multidimensional construct. Although a variety of conceptual schemes have been used to identify the major dimensions of social support, a wide range of investigators endorses four dimensions most frequently. Structural characteristics of the support network—typically network size—compose the most objective dimension and focus on the potential availability of social support. Social interaction captures the extent to which the individual is in contact with and spends time with support network members. Instrumental assistance refers to the tasks performed for the individual by members of the support network (e.g., providing transportation, care when sick) and includes both regular and as-needed contributions. The final dimension consists of the individual's satisfaction with the amount and quality of social support available and is typically termed subjective social support. In the broader research on social support and health, subjective social support is consistently the most powerful predictor of health outcomes, although all four dimensions are typically significantly related to health outcomes. In research on the mediating effects of social support on the relationship between religious involvement and health, social interaction has been most frequently examined.

Evidence concerning the extent to which social support mediates the relationship between religious in-

volvement and health has been mixed. Most attention has focused on the extent to which social interaction mediates the effects of public religious participation (i.e., attending services) on mortality. In six studies, social interaction had no mediating effects, although it was an independent predictor of mortality (Bryant & Rakowski, 1992; Goldman et al., 1995; House, Robbins, & Metzner, 1982; Hummer et al., 1999; Koenig et al., 1999; Oman & Reed, 1998). In contrast, two studies report that levels of social interaction with network members partially mediate the relationship between attending religious services and mortality (Rogers, 1996; Strawbridge et al., 1997).

Tests of the mediating effects of other dimensions of social support on the relationship between service attendance and mortality have been even less consistent. Musick, House, and Williams (1999) reported that the presence of a confidant mediates this relationship; Koenig et al. (1999) found no mediating effects for the availability of a confidant. Koenig et al. (Koenig, Larson, et al., 1998; Koenig et al., 1999; studies with different samples) found no evidence that either network size or subjective social support mediated the relationship between religious attendance and mortality.

For health outcomes other than mortality, evidence is sparse. As noted earlier, only one longitudinal study has examined possible mediators of the relationship between religious attendance and disability. In that study, social interaction failed to mediate that relationship (Idler & Kasl, 1992). Three longitudinal studies examined the relationship between religious attendance and depression; in all three, social support failed to mediate the relationship (Musick, Koenig, Hays, & Cohen, 1998, who examined instrumental support and subjective social support; Musick et al., 2000, who examined social interaction and subjective social support; Ellison, Musick, Levin, Taylor, & Chatters, 1997, who examined subjective social support).

An obvious omission with regard to health outcomes is physical health. Although no longitudinal studies have examined the mediating effects of social support on physical health, two cross-sectional studies have. Both studies relied on composite measures of religious involvement (rather than a single dimension); the social support measures also aggregated scores across multiple dimensions. Koenig, Hays, et al. (1997) reported that social support failed to mediate the relationship between religious participation and physical health status. Ferraro and Koch (1994) found that social support was not a significant mediator for Whites but explained 25% of the relationship between religious participation and physical health for African Americans.

It should be noted that when social support fails to mediate the relationship between religion and health, this does not mean that social support is unimportant for health. Indeed, in every study cited in which social

support did not mediate that relationship, it was a statistically significant predictor of the health outcome (mortality, disability, depression, physical health). Social support is robustly related to health. The question that remains unanswered is the extent to which it mediates the religion–health connection.

Clearly, much more research is needed before firm conclusions can be reached about the possible role that social support plays as a mechanism by which religious involvement promotes health and longevity. Many combinations of dimensions of religious involvement, health outcomes, and social support dimensions have not been tested at all. Before launching such studies, a study by Ellison et al. (1997) merits note. Ellison et al. compared the effects of secular and religious support as mediators of the relationship between religious attendance and psychological distress. Secular support was operationalized as support obtained from family and friends—the usual method of assessing social support. Religious support was operationalized as support received from members of one's religious congregation. Secular social support was related to lower levels of distress for the entire sample, although it did not mediate the effects of attendance on distress. Among church members, however, religious support also was associated with less distress and totally mediated the relationship between attendance and distress. Thus, it may be that studies that rely on measures of social support from the typical sources of friends and family may be inappropriate tests of the mediating effects of social support. It may be social support received from fellow congregation members that is a pathway by which social support mediates the effects of religion on health.

Psychosocial Resources

A third mechanism that may partially explain the health benefits of religious participation is psychosocial resources such as self-esteem, self-efficacy, and mastery. There is substantial evidence that religious participation is associated with higher levels of these psychosocial resources, although this evidence is based on cross-sectional data (e.g., Ellison, 1993; Krause, 1995). There also is evidence that these psychosocial resources are associated with better health, although, again, this conclusion rests largely on the results of cross-sectional studies (e.g., Pearlin, Lieberman, Menaghan, & Mullin, 1981; Turner & Lloyd, 1999). Moreover, self-esteem, self-efficacy, and mastery have been demonstrated to mediate the effects of several other social factors that predict health and mortality, including socioeconomic status, stressful life events, chronic stressors, and social support.

Unfortunately, only four studies have tested the mediating effects of psychosocial resources on the reli-

gion–health relationship—three are cross-sectional, and one is longitudinal. Ellison et al. (1997) and Braam et al. (1998) reported that self-esteem failed to mediate the effects of service attendance on depressive symptoms. In contrast, Krause (1992) and Commerford and Reznikoff (1996) found that self-esteem and sense of mastery, respectively, partially mediated the effects of religious involvement (service attendance and reliance on religion) on psychological distress. Clearly, no conclusions are possible about the extent to which psychosocial resources mediate the effects of religious involvement on the broad range of appropriate health outcomes. Additional research on this possible pathway by which religion promotes health is badly needed.

Sense of Coherence or Meaning

Antonovsky (1980) introduced the construct, sense of coherence (SOC), in his efforts to understand the conditions under which stress does and does not damage health. SOC is essentially a worldview regarding the nature of human existence in general rather than one's personal life circumstances. Antonovsky posited that SOC has three components: meaning, predictability, and manageability. For Antonovsky, beliefs that the world is meaningful, predictable, and manageable are important “resistance resources” that permit individuals to experience stress as less threatening, to cope more effectively with it, and to be less likely to experience stress-related illness. Antonovsky also pointed out that individuals are likely to develop a SOC (or lack of it) based on the belief systems of their cultures and the social institutions in which they participate. Several authors have suggested that religions typically provide their members with a worldview, and often this worldview would seem to meet Antonovsky's concept of SOC (e.g., Berger, 1967).

Although Antonovsky's SOC is often cited in U.S. research as a justification for specific hypotheses or as a post hoc explanation for observed findings, it has seldom been operationalized, measured, and empirically tested. This stands in stark contrast to its widespread use in European and, especially, Israeli research on psychosocial factors and health. Unfortunately, most of this research is not available in English.

Research on religion and health has the same history as other research topics with regard to SOC: Investigators have hypothesized that SOC may mediate the relationship between religious participation and health (e.g., Idler, 1987), but this hypothesis has not yet been directly tested. Kark, Carmel, Sinnreich, Goldberger, and Friedlander (1996) and Kark, Shermi, et al. (1996) are the single set of investigators (whose work is in English) who directly measured SOC and attempted to use it as an explanation for mortality differences in secular and religious kibbutzim in Israel. Their argument

is developed over the course of two studies. In the first, they compared age-matched mortality rates in 11 secular and 11 religious kibbutzim, matched on socioeconomic status, over a 16-year interval (Kark, Shermi, et al., 1996). Death rates were substantially and significantly higher in the secular kibbutzim. In an effort to understand the mortality difference, Kark, Carmel, et al. went to 10 of the 22 kibbutzim (5 secular and 5 religious) and surveyed residents on potential explanatory variables: SOC, self-esteem, stress, social support, social interaction, and voluntary contributions to the kibbutz. The two variables that significantly differed across secular and religious kibbutzim were SOC and voluntary contributions, with higher levels among residents of religious kibbutzim. Obviously, this is not a mediating study—the individuals surveyed were not the individuals who died. Nonetheless, these findings suggest the value of research that examines SOC as a potential mediator of the relationship between religion and health.

Although we are aware of no direct test of the mediating role of SOC, several studies have examined components of religious cognitions that appear similar to the dimensions of SOC proposed by Antonovsky. For example, Ryan, Rigby, and King (1993) compared two groups of persons who attended religious services regularly: those who reported that their religious beliefs serve as the major motivation and explanation for behavior, and those who viewed their religious beliefs as appropriate guidelines for behavior but not as their major motivation. The former, who seem to rely on religion for providing the worldview that dominates their lives, averaged significantly fewer symptoms of depression, anxiety, and somatization than the latter. These findings suggest that religious worldviews may be one pathway by which religious participation promotes health.

Another important distinction in research on religious participation is intrinsic versus extrinsic motivation. Individuals who participate in religion for intrinsic reasons report that their major motivation is to know, communicate with, and/or serve God (or a higher power). In contrast, extrinsic motivations for religious participation focus on the more tangible rewards of involvement such as status, meeting people, and social interaction. A vast literature documents the wide variability in the motivations that underlie religious participation. Unfortunately, little research has examined the links between intrinsic and extrinsic religious motivation and health. However, two studies—one of seriously ill patients (Acklin, Brown, & Mauger, 1983) and one of college students (Plante & Boccaccini, 1997)—reported that intrinsic religious motivation is associated with significantly lower levels of depression and anxiety.

Ellison (1991) found that the aspect of religious participation most strongly related to psychological well-

being was existential certainty, which he also termed existential coherence. Existential certainty was operationalized as the strength of one's convictions about the importance of religion in providing meaning in specific life domains. Indeed, existential certainty mediated the relationship between religious service attendance and psychological well-being. In a similar vein, Krause, Ingersoll-Dayton, Ellison, and Wulff (1999) found that religious doubt (the opposite of existential certainty, as Ellison defined it) is associated with higher levels of psychological distress.

Religious motivations and existential certainty are meaning structures that are less global than SOC, as Antonovsky defined. Some scholars (e.g., Baumeister, 1991) have suggested that meaning making occurs largely at the level of specific events and experiences rather than as a result of global belief structures. A reasonable goal for future research would be to compare global and specific belief structures related to religious participation as possible mediators of the religion–health connection.

Thus, the few studies of religious motivations and beliefs available suggest potential mediating effects, although they were not designed to trace the pathways by which religion affects health. One of the most intriguing aspects of these studies is their ability to explain variability in mental health outcomes among those who participate regularly in public religious activities. Clearly, studies that target the potential mediating effects of SOC and related constructs are a high priority for future research.

Alternate Forms of the Religion–Health Relationship

The research strategy that has been used in most studies has been to (a) establish the existence of a relationship between religious involvement and health and then (b) attempt to identify the mediating processes or mechanisms that can account for that relationship. That is clearly a valid strategy. It also is possible, however, that other forms of the effects of religion on health are worth investigation. One way that religion may affect health that is not examined in studies of mediating effects is interactive effects. That is, religious involvement may buffer the effects of stress, thus decreasing the likelihood of a negative health outcome.

Although the research base is small, several investigators have examined the buffering effects of religious involvement on health. Interestingly, both positive and negative health effects have been observed. Both Maton (1989) and Williams, Larson, Buckler, Heckmann, and Pyle (1991) found that religious involvement buffered the effects of stress on depression (Maton investigated perceived support from God; Williams et al. examined religious service attendance). In

both samples, religious involvement was unrelated to depression among persons with low stress but reduced depression among persons experiencing high levels of stress.

Strawbridge, Shema, Cohen, Roberts, and Kaplan (1998) reported mixed results with regard to the stress-buffering properties of service attendance and private religious practices on depression. In general, religious involvement reduced the effects of nonfamily stressors on depression but exacerbated the effects of family stressors. Finally, Brown, Gary, Greene, and Milburn (1992) found that higher levels of religious involvement (a composite measure) exacerbated the effects of chronic economic strain on depression.

Clearly, the extent to which religious involvement buffers the effects of stress merits additional research. Although not a mediating effect, it is possible that buffering (or exacerbating) the effects of stress may be one of the pathways by which religion affects health. Moreover, interactive effects often explain inconsistencies across studies. Depending on the distribution of stress in various samples, the effects of religious variables on health outcomes could vary widely, ranging from a negative effect to no effect to a positive effect.

Conclusions and Future Directions

The primary message from the research reviewed previously here is that we are far from understanding the mechanisms by which religious involvement promotes health. Four potential mediators of the religion–health relationship have been examined to varying degrees: health practices, social support, psychosocial resources, and belief structures such as SOC. Evidence to date is mixed, with some studies supporting the mediating hypotheses and others refuting it. It seems likely, however, that these four factors will prove to be insufficient to explain fully the pathways by which religious involvement promotes health and longevity. In this section, we discuss some of the obvious gaps in research to date and develop rationales for other possible mediators of the religion–health connection.

Three issues that were not discussed previously here merit brief attention. First, although some of the strongest relationships between religious participation and health concern the effects of religious coping on the course and outcome of illness, there have been no efforts to identify factors that may mediate this relationship. That is probably an appropriate decision rather than the result of neglect or oversight. It is difficult to develop rationales for possible mediators of the relationship between religious coping and health. Indeed, some authors contend that religious coping is one of the mechanisms by which more general indicators of religious participation (e.g., service attendance) promote health (e.g., Pargament, 1997). This does not

mean that how and why religious coping promotes health cannot be established. It is unlikely, however, that conventional analyses of potential mediating effects are likely to be the tools that identify those mechanisms.

Second, possible biological mediators of religion–health relationships have not been discussed. Very few studies have examined the biological correlates of religious participation. However, there is limited evidence, based on cross-sectional data, suggesting that religious participation is associated with higher levels of immune functioning (Koenig, Cohen, et al., 1997). We view biological processes as one form of mediator of the relationship between religion and health. Indeed, it is doubtful that *any* psychological or social factor can affect health without somehow harming or fortifying biological processes that result in health or illness. Our focus, however, is on the social and psychological processes by which religion promotes health—processes that undoubtedly have biological concomitants.

Third, a limitation of the samples used in research investigating the links between religion and health merits note. Although the quality of the samples in this research domain has improved dramatically over the past 2 decades, they are, for all practical purposes, restricted to Christians. Representative community samples, which are used with increasing frequency, simply do not include sufficient numbers of non-Christians to permit separate analyses or comparisons with Christians. The non-Christians in samples studied to date are not excluded from analysis; there simply are not enough of them to know if the effects of religion on health are similar for Christians and non-Christians. A valuable contribution to this research base would be to sample non-Christians in sufficient numbers to permit both comparisons with the dominant religious affiliations of American society and separate analyses of them. Part of the reason for this is, of course, generalizability. In addition, however, if there are differences based on the cultural centrality of religious denominations, with members of mainstream religions benefitting most, this would provide a clue to one of the possible explanations for the links between religion and health.

Because we have yet to explain fully the relationships between religion and health, there are many potentially fruitful directions for future research. First, as noted throughout the article, even those mediators that have been examined merit more comprehensive investigation. There has not yet been systematic examination of the extent to which health practices, social support, and psychosocial resources mediate the relationships between all pertinent dimensions of religious participation and all relevant health outcomes. In addition, of course, it is important to determine the extent to which SOC and related constructs explain the relation-

ships between various dimensions of religious involvement and multiple health outcomes, using appropriate techniques for assessing mediation.

Possible interactions between religious participation and other risk and protective factors also merit extensive examination. As reviewed previously here, some evidence suggests that religious involvement interacts with acute and chronic stresses to influence health—sometimes reducing the likelihood of negative health outcomes, but sometimes exacerbating the health-damaging effects of stress. It also is likely, however, that other factors related to morbidity and mortality interact with religious involvement. For example, religious involvement may interact with social support to influence health. Thus, religious involvement may have stronger health benefits for persons with low levels of social ties than for persons with extensive, high-quality social networks.

It also may be useful to further disaggregate measures of religious involvement. The example of positive versus negative religious coping provides an illustration of the potential value of such efforts. This distinction led to two important conclusions: (a) The relationships between religious coping and health were strengthened by assessing positive and negative coping separately, and (b) desegregation provides a more complete picture of how religious coping can either promote or harm health. As noted previously, the distinction between intrinsic and extrinsic religious motivation also may provide more fine-grained understanding of the conditions under which religious has beneficial effects on health. Alternatively, specific constellations of religious beliefs (e.g., concerning sin or forgiveness) may have different implications for health.

Efforts also are needed to identify additional possible mediators of the relationships between religion and health and to then test them empirically. Efforts to date have focused largely on factors known to promote health independently and to determine whether they also mediate the relationship between religious involvement and health. This has been a sensible strategy, but it is based on the assumption that religion “works” via standard risk and protective factors. It also is possible that religion affects health via mechanisms that have not been identified as predictors of health outcomes in previous research. One possibility in this regard is beliefs or expectancies. The power of expectancies to influence health has long been established in the form of the placebo effect. Similar processes may be operating with regard to religion and health. That is, if individuals believe that they will be cured (or recover faster, or maintain their health despite stress, etc.) as a result of their faith in a benevolent higher power, those beliefs may become self-fulfilling prophecies. Indeed, even the strong relationship between attendance at religious services and health may be explained, in part, by expectancies if people attend services to mobilize the

prayers of their faith community or seek assurance that prayers are answered. This is not a rationale for explanations based on “divine intervention,” which we, as scientists, do not view as generating testable hypotheses, but rather an hypothesis based on the power of belief. Science cannot tell us whether God heals, but it can tell us whether belief in God affects health.

Other potential mediators that have received little to no attention to date include examination of religious forms of standard risk factors for morbidity and mortality. As described previously here, Ellison et al. (1997) found that religious social support (i.e., support received from members of one’s congregation) fully mediated the relationship between service attendance and psychological well-being. Similarly, Pollner (1989) found that “divine support,” which was operationalized as the belief that one receives personal support from God or a higher power, was a significant predictor of psychological well-being, with other known predictors statistically controlled. Recall also that religious coping typically predicts health outcomes over and above the effects of nonreligious coping (e.g., Pargament, 1977). These rather isolated findings suggest that one of the ways that religion promotes health may be by adding to one’s repertoire of social resources, rather than operating through known risk and protective factors. Systematic investigation of this issue will be required, however, before this can be asserted with confidence.

One of the nagging issues that may affect the relationships observed between religion and health is selection effects. Because we cannot randomly assign individuals to levels of religious participation, we can never be sure that selection effects do not lead to both religious involvement and better health. There has been considerable investigation of selection effects from the perspective of social characteristics. The social correlates of religious participation—race, age, gender, education, income, marital status—have been identified and are routinely included in statistical models estimating the effects of religious participation on health, and it is quite clear that those social factors do not account for the link between religion and health. As noted previously here, baseline health is routinely included in longitudinal investigations as a possible selection factor for religious participation. The possibility that psychological factors may select individuals into religious participation and also promote health and longevity, however, has been virtually ignored. For example, some authors have suggested that personal preferences for risk taking versus risk avoidance may be related to religious participation (e.g., Ellison & Levin, 1998), although empirical support for this proposition is lacking. Moreover, to our knowledge, there has been no systematic examination of the effects of personality traits on religious participation. This is a high-priority issue for future research.

Finally, with regard to important areas for future research, there is the need to understand better life course patterns of religious involvement. All of the research reviewed previously here is based on measures of religious participation at the time of data collection (e.g., how often do you attend religious services?). This is comparable to a question in an epidemiologic survey that asks participants if they had a cigarette today. Had the data available to epidemiologists on smoking been restricted to recent experience, it is highly unlikely that the link between smoking and health problems would have been established. It was not until epidemiologists developed a strategy for measuring pack-years of smoking that the effects of smoking on health were revealed. Currently, our knowledge of religious participation is comparable to knowing if an individual had a cigarette today. Measures of long-term religious participation are badly needed to understand better the effects of religion on health (one attempt to do this is found in Hays, Meador, Branch, & George, 2001). With knowledge of long-term patterns of religious participation, it will be possible to address issues such as these: the duration of exposure to religious involvement required before health effects can be observed, whether stable patterns of religious involvement have stronger effects on health than irregular patterns, and whether identifying the reasons that individuals elect to drop out of or commit themselves to religious participation point the way to selection effects that may be confounding the relationship between religion and health.

We find the quest to identify the mechanisms by which religion affects health to be both intellectually and methodologically challenging. Conventional theories about the social and psychological antecedents of health and longevity have not fully elucidated the processes underlying the link between religion and health. Fresh ideas, coupled with sophisticated causal modeling, will be required to further our knowledge of what explains the relationship between religion and health.

Notes

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References

- Acklin, M. W., Brown, E. C., & Mauger, P. A. (1983). The role of religious values in coping with cancer. *Journal of Religion and Health*, 22, 322–333.
- Antonovsky, A. (1980). *Health, stress, and coping*. San Francisco: Jossey-Bass.
- Asser, S. M., & Swann, R. (1998). Child fatalities from religion-motivated medical neglect. *Pediatrics*, 101, 625–629.
- Baumeister, R. F. (1991). *Meanings of life*. New York: Guilford.
- Berger, P. (1967). *The sacred canopy*. New York: Doubleday.
- Braam, A. W., Beekman, A. T. F., Knipscheer, C. P. M., Deeg, D. J. H., van den Eeden, P., & van Tilburg, W. (1998). Religious denomination and depression in older Dutch citizens: Patterns and models. *Journal of Aging and Health*, 9, 483–503.
- Brown, D. R., Gray, L. E., Greene, A. D., & Milburn, N. G. (1992). Patterns of social affiliation as predictors of depressive symptoms among urban blacks. *Journal of Health and Social Behavior*, 33, 242–266.
- Bryant, S., & Rakowski, W. (1992). Predictors of mortality among elderly African Americans. *Research on Aging*, 14, 50–67.
- Commerford, M., & Reznikoff, M. (1996). Relationship of religion and perceived social support to self-esteem and depression in nursing home residents. *Journal of Psychology*, 130, 35–50.
- Ellison, C. G. (1991). Religious involvement and subjective well-being. *Journal of Health and Social Behavior*, 32, 80–99.
- Ellison, C. G. (1993). Religious involvement and self-perception among Black Americans. *Social Forces*, 71, 1027–1055.
- Ellison, C. G. (1995). Race, religious involvement, and depressive symptomatology in a southeastern U.S. community. *Social Science and Medicine*, 40, 1561–1572.
- Ellison, C. G., & Levin, J. S. (1998). The religion-health connection: Evidence, theory, and future directions. *Health Education & Behavior*, 25, 700–720.
- Ellison, C. G., Musick, M., Levin, J., Taylor, R., & Chatters, L. (1997, August). The effects of religious attendance, guidance, and support on psychological distress: Longitudinal findings from the National Survey of Black Americans. Paper presented at the annual meetings of the Society for the Scientific Study of Religion, San Diego, CA.
- Ferraro, K. F., & Koch, J. R. (1994). Religion and health among black and white adults: Examining social support and consolation. *Journal for the Scientific Study of Religion*, 33, 362–375.
- Gardner, J. W., Sanborn, J. S., & Slatery, M. L. (1995). Behavioral factors explaining the low risk for cervical carcinoma in Utah Mormon women. *Epidemiology*, 6, 187–189.
- George, L. K., Larson, D. B., Koenig, H. G., & McCullough, M. E. (2000). Spirituality and health: What we know, what we need to know. *Journal of Social and Clinical Psychology*, 19, 102–116.
- Goldman, N., Korenman, S., & Weinstein, R. (1995). Marital status and health among the elderly. *Social Science and Medicine*, 40, 1717–1730.
- Hays, J. C., Meador, K. G., Branch, P. S., & George, L. K. (2001). The history of religion and spirituality scale in four dimensions (HRSS-4): Validity and reliability. *The Gerontologist*, 239–241.
- House, J. S., Landis, K. R., & Umberson, D. (1988). Social relationships and health. *Science*, 241, 540–545.
- House, J. S., Robbins, C., & Metzner, H. L. (1982). The association of social relationships and activities with mortality: Prospective evidence from the Tecumseh Community Health Study. *American Journal of Epidemiology*, 116, 123–140.
- Hummer, R. A., Rogers, R. G., Nam, C. B., & Ellison, C. G. (1999). Religious involvement and U.S. adult mortality. *Demography*, 36, 273–285.
- Idler, E. L. (1987). Religious involvement and the health of the elderly: Some hypotheses and an initial test. *Social Forces*, 66, 226–238.
- Idler, E. L., & Kasl, S. V. (1992). Religion, disability, and the timing of death. *American Journal of Sociology*, 97, 1052–1079.
- Idler, E. L., & Kasl, S. V. (1997). Religion among disabled and non-disabled persons: II. Attendance at religious services as a predictor of the course of disability. *Journal of Gerontology: Social Sciences*, 52B, S306–S316.

- Kark, R. L., Carmel, S., Sinnreich, R., Goldberger, N., & Friedlander, Y. (1996). Psychosocial factors among members of religious and secular kibbutzim. *Israeli Journal of Medical Science*, 32, 185-194.
- Kark, R. L., Shermi, G., Friedlander, Y., Martin, O., Manor, O., & Bondheim, S. H. (1996). Does religious observance promote health? Mortality in secular vs. religious kibbutzim in Israel. *American Journal of Public Health*, 86, 341-346.
- Koenig, H. G. (1997). *Is religion good for your health? Effects of religion on mental and physical health*. New York: Haworth.
- Koenig, H. G., Cohen, H. J., Blazer, D. G., Pieper, C., Meador, K. G., Shelp, F., et al. (1992). Religious coping and depression among elderly, hospitalized medically ill men. *American Journal of Psychiatry*, 149, 1693-1700.
- Koenig, H. G., Cohen, H. J., George, L. K., Hays, J. C., Larson, D. B., & Blazer, D. G. (1997). Attendance at religious services, interleukin-6, and other biological indicators of immune function in older adults. *International Journal of Psychiatry in Medicine*, 27, 233-250.
- Koenig, H. G., & George, L. K. (1998). Depression and disability outcomes in depressed medically ill hospitalized older adults. *American Journal of Geriatric Psychiatry*, 6, 230-247.
- Koenig, H. G., George, L. K., Cohen, H. J., Hays, J. C., Blazer, D. G., & Larson, D. B. (1998). The relationship between religious activities and blood pressure in older adults. *International Journal of Psychiatry in Medicine*, 28, 189-213.
- Koenig, H. G., George, L. K., & Peterson, B. L. (1998). Religiosity and remission from depression in medically ill older adults. *American Journal of Psychiatry*, 155, 536-542.
- Koenig, H. G., Hays, J. C., George, L. K., Blazer, D. G., Larson, D. B., & Landerman, L. R. (1997). Modeling the cross-sectional relationships between religion, physical health, social support, and depressive symptoms. *American Journal of Geriatric Psychiatry*, 5, 131-144.
- Koenig, H. G., Hays, J. C., Larson, D. B., George, L. K., Cohen, H. J., McCullough, M. E., et al. (1999). Does religious attendance prolong survival? A six-year follow-up study of 3,968 older adults. *Journal of Gerontology: Medical Sciences*, 54A, M370-M376.
- Koenig, H. G., Larson, D. B., Hays, J. C., McCullough, M. E., George, L. K., Branch, P. S., et al. (1998). Religion and survival of 1010 male veterans hospitalized with medical illness. *Journal of Religion and Health*, 37, 15-29.
- Krause, N. (1992). Stress, religiosity, and psychological well-being among older blacks. *Journal of Aging and Health*, 4, 412-439.
- Krause, N. (1995). Religiosity and self-esteem among older adults. *Journal of Gerontology: Psychological Sciences*, 50, P236-P246.
- Krause, N., Ingersoll-Dayton, B., Ellison, C. G., & Wulff, K. M. (1999). Aging, religious doubt, and psychological well-being. *The Gerontologist*, 39, 525-533.
- Levin, J. S. (1994). Religion and health: Is there an association, is it valid, and is it causal? *Social Science and Medicine*, 38, 1475-1482.
- Maton, K. I. (1989). The stress-buffering role of spiritual support: Cross-sectional and prospective investigations. *Journal for the Scientific Study of Religion*, 28, 310-323.
- Musick, M. A., Blazer, D. G., & Hays, J. C. (2000). Religious activity, alcohol use, and depression in a sample of elderly Baptists. *Research on Aging*, 22, 91-116.
- Musick, M. A., House, J. S., & Williams, D. R. (1999, August). *Attendance at religious services and mortality in a national sample*. Paper presented at the Annual Meetings of the American Sociological Association, Chicago, IL.
- Musick, M. A., Koenig, H. G., Hays, J. C., & Cohen, H. J. (1998). Religious activity and depression among community-dwelling elderly persons with cancer: The moderating effect of race. *Journal of Gerontology: Social Sciences*, 53B, S218-S227.
- National Institute on Aging/Fetzer Institute Working Group. (1997). *Measurement scales on religion, spirituality, health, and aging*. Bethesda, MD: National Institute on Aging.
- Oman, D., & Reed, D. (1998). Religion and mortality among community dwelling elderly. *American Journal of Public Health*, 88, 1469-1475.
- Oxman, T. E., Freeman, D. H., & Manheimer, E. D. (1995). Lack of social participation or religious strength and comfort as risk factors for death after cardiac surgery in the elderly. *Psychosomatic Medicine*, 57, 5-15.
- Pargament, K. I. (1997). *The psychology of religion and coping*. New York: Guilford.
- Pearlin, L. I., Lieberman, M. A., Menaghan, E. G., & Mullin, J. T. (1981). The stress process. *Journal of Health and Social Behavior*, 22, 337-356.
- Phillips, R. L., Kuzma, J. W., Benson, W. L., & Lotz, T. (1980). Influence of selection versus lifestyle on risk of fatal cancer and cardiovascular disease among Seventh-Day Adventists. *American Journal of Epidemiology*, 112, 296-314.
- Plante, T. G., & Boccaccini, M. T. (1997). The Santa Clara strength of religious faith questionnaire. *Pastoral Psychology*, 45, 375-387.
- Pollner, M. (1989). Divine relations, social relations, and well-being. *Journal of Health and Social Behavior*, 30, 92-104.
- Rogers, R. G. (1996). The effects of family composition, health, and social support linkages on mortality. *Journal of Health and Social Behavior*, 37, 326-338.
- Ryan, R. M., Rigby, S., & King, K. (1993). Two types of religious internalization and their relations to religious orientations and mental health. *Journal of Personality and Social Psychology*, 65, 586-596.
- Simpson, W. F. (1989). Comparative longevity in a cohort of Christian scientists. *Journal of the American Medical Association*, 262, 1657-1658.
- Strawbridge, W. J., Cohen, R. D., Shema, S. J., & Kaplan, G. A. (1997). Frequent attendance at religious services and mortality over 28 years. *American Journal of Public Health*, 87, 957-961.
- Strawbridge, W. J., Shema, S. J., Cohen, R. D., Roberts, R. E., & Kaplan, G. A. (1998). Religiosity buffers the effects of some stressors on depression but exacerbates others. *Journal of Gerontology: Social Sciences*, 53B, S118-S126.
- Turner, R. J., & Lloyd, D. A. (1999). The stress process and the social distribution of depression. *Journal of Health and Social Behavior*, 40, 374-404.
- Wallace, J. M., & Forman, T. A. (1998). Religion's role in promoting health reducing risk among American youth. *Health Education and Behavior*, 25, 721-741.
- Williams, D. R., Larson, D. B., Buckler, R. E., Heckmann, R. C., & Pyle, C. M. (1991). Religion and psychological distress in a community sample. *Social Science and Medicine*, 32, 1257-1262.

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