RELIGION, RELIGIOSITY AND SPIRITUALITY IN THE BIOPSYCHOSOCIAL MODEL OF HEALTH AND AGEING*

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Religiosity/spirituality and the tendency to use these in coping are common in older adults. We review evidence that these are positively associated with mental and physical health in older adults, as well as evidence that members of different religious groups differ in levels of health. Studies on mental health include those that examine well-being and depression. Physical health outcomes include mortality, cancer, stroke, and physical functioning. We discuss the issue of causality and possible mediators of effects of religiosity/spirituality on health outcomes, paying special attention to possible psychological mediators. Last, we discuss possible differences in these associations between members of various cultural and religious groups, and caution that there may be theological problems with the use of religion to promoting health.

The Importance of Religion

Religiosity is important to many people in our society, and more important to older adults than to younger adults. Princeton Religious Research Center's national surveys (1994) show that three-quarters of older Americans say that religion is very important in their lives. This is a much higher proportion than the 44% of people under the age of 30 who respond similarly, higher than the 54% of people between the ages of 30-49, and the 69% of people aged 50-64.

Accordingly, religious coping is a common way that older people deal with problems. Koenig, Weiner, Peterson, Meador, and Keefe (1997) performed comprehensive health and psychosocial assessments of more than 100 chronic care nursing home residents, which showed that a large proportion—nearly 60%—of them indicated that they use religion to a large extent as a coping mechanism. One-third of the sample claimed that religion was the most im-

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portant factor in their coping. Religious coping was associated in this sample with more social support, worse illness, and better cognitive functioning. In a similar study, Koenig (1998a) showed that among 330 consecutively admitted medical patients over age 60, more than 40% spontaneously named religion as the most important factor that helped them cope with their illness. On direct questioning, almost 90% said they used religion to help them to cope to at least a moderate extent. In another study on religion and coping, Koenig (1995) investigated the extent of religious coping among imprisoned older men. In this sample, about one-third of the sample claimed religion to be the most important coping method.

Religion is not only used as a coping resource for the disabled, ill, imprisoned, or people in other types of unfortunate life circumstances. Koenig, George, and Siegler (1988) showed that among those aged 55-80, 45% of the 100 participants that were interviewed used religion to cope during at least one of three stressful life periods (including their entire life, the present, or the past 10 years). These data came from open-ended responses, and religious coping was spontaneously named by a large proportion of this sample. Methods of coping included, for example, prayer, trusting in God, and depending on the support of clergy or members of one's church.

The importance of religion as a coping mechanism makes investigations of relationships between religious variables and health outcomes a clinically important area of research. A sizable amount of research leads us to the conclusion that there are consistent relationships between religious variables and health outcomes in older adults. Religious variables include relationships with religiosity or spirituality, as well as effects of religious group affiliation on health outcomes. Health outcomes include physical health, mental health and well-being, and a host of other related variables. Following is a review of some of the literature in these areas.

Because of space limitations, we cannot comprehensively review all of the studies. Rather, we will review studies that relied on solid methodology, used representative samples, or in some other way pointed to important conclusions. Similarly, we do not have the space to discuss the relationship of religion or spirituality to every health outcome, so we have picked areas in which good research has been done in older adults. For a more comprehensive review, we commend to the reader's attention a recent handbook that reviews research on religion and health (Koenig, McCullough, & Larson, 2001). As we review the literature, we discuss a theoretically and clinically important issue, that of the possible directions of causal relationships between religion and health. After we review studies on religion and health, we will talk about some theoretical and empirical difficulties, including issues of mediation, and possible cultural differences. Last, we will point out possible theological difficulties that might arise with the potential promotion of religiosity or spirituality for the sake of better health. In reviewing and discussing this research, we may seem to present only studies that demonstrate the relationship of reli-

gious variables with salubrious health outcomes, and one might question whether we are simply ignoring a body of work showing associations of religious variables with poor health outcomes. We believe that the evidence for positive religion-health effects is much more persuasive than evidence for negative effects, of which there is very little, especially in older adults.

In all this we will try to relate our discussion to the biopsychosocial model of ageing. At its heart, a biopsychosocial model of ageing is an integrative paradigm that is concerned with three levels of analysis: biological, psychological, and social. We believe there is a complex but fundamental interrelationship among these three domains. Thus, an understanding of these factors and their connections is crucial in the study of ageing to have a complete picture. Based on this goal of a truly multidisciplinary approach, we consider research that examines links between religious affiliation and health outcomes, as well as research on health outcomes of varying levels of religiosity and spirituality. Religious affiliation is sometimes downplayed in efforts to make research applicable to everyone in all religions, but we think this is a mistake because members of different religions can differ from each other in ways that could be important for health outcomes.

In deciding what studies are relevant to the issue of religion, religiosity, spirituality, and health, we have to be clear about what we mean by those terms. By religion or religious affiliation we usually mean one's faith community (e.g. Jewish, Protestant, Hindu, etc.). Defining religiosity and spirituality is stickier; we will discuss this next.

Defining Religiosity and Spirituality

In a biopsychosocial model, it is possible to define religiosity and spirituality in many different ways. In much past research and discussion on these topics, religiosity has been used primarily to refer to affiliation with organized and institutional religion. Spirituality, in contrast, has been characterized as a search for the sacred, and has been called the core of religiosity; spirituality is often portrayed as more individual and internalized than religiosity (Daaleman & VandeCreek, 2000; Hill & Pargament, 2003; Koenig, McCullough, & Larson, 2001; Pargament & Mahoney, 2002; Zinnbauer, Pargament, Cole, Rye, Butter, Belavich, Hipp, Scott, & Kadar, 1997; Zinnbauer, Pargament & Scott, 1999). The current popularity of spirituality in American culture, insofar as spirituality is largely understood to be personal, may be a legacy of the historical development of Protestant theology (Shuman & Meador, 2003). Protestantism was and is a major influence on the highly individualistic construction of the self in American culture (Bellah, Madsen, Sullivan, Swidler, & Tipton, 1985; Kitayama & Markus, 1999; Markus & Kitayama, 1991; Snibbe & Markus, 2002).

Perhaps because current conceptions of religiosity and spirituality are idiosyncratic, such definitions promote significant theoretical challenges. They

make it quite challenging to define the terms operationally, particularly in ways that distinguish them from each other. Another reason that religiosity is hard to define is that great figures in the history of the social sciences have offered radically different definitions of religiosity. Some focused on the personal (e.g. James, 1902/1997) and some on the societal level (e.g. Durkheim, 1912/1995). In addition to these theoretical challenges, there are empirical challenges in separating religiosity from spirituality; religiosity and spirituality can be highly correlated (Cohen & Rozin, 2001; Musick, Trapahagen, Koenig, & Larson, 2000; Zinnbauer, et al., 1997).

However, some recent empirical work has begun to clarify how people self-define themselves as religious or spiritual. Shahabi, Powell, Musick, Pargament, Thoresen, Williams, Underwood, and Ory (2002) examined the correlates of people reporting spiritual experiences in a representative sample of American Catholics and Protestants in the 1998 General Social Survey data set. Spiritual but not religious people, while not a homogenous group, tended to be young, female, highly educated, not Catholic and not living in the South.

Because of our interest in the biopsychosocial model of relationships between religiosity, spirituality and health, we propose that both spirituality and religiosity can encompass personal and institutional elements, and that each of these aspects is relevant in the study of health. Therefore, without getting too bogged down in whether effects are due to religiosity or to spirituality, we will discuss research relevant to both of these dimensions: the personal and the institutional forms of religiosity or spirituality. This is similar to the approach of Moberg's (1970) analysis of religion in older adults, who described two basic orientations of religiosity: personal and institutional. Personal orientations are related to people's values, beliefs, and attitudes, whereas institutional orientations are more related to church attendance and other group-level behaviors. Such a distinction, while broad, represents a useful heuristic for the study of health and well-being (Koenig, Kvale, & Ferrel, 1988).

We now review work on relations of religion, religiosity, and spirituality to mental and physical health.

Mental Health

Well-Being and Life Satisfaction. Koenig, McCullough, and Larson (2001) discovered 17 cross-sectional studies showing positive associations between religiosity and well-being in older adults. Seven cross-sectional studies were found that showed no relationship between religious variables and measures of well-being. They could locate no studies showing an inverse relationship in older adults. Some of the most impressive positive findings are reviewed in some detail below.

Correlations between religiosity and well-being can be surprisingly strong. For example, Coke (1992) showed that among 166 African Americans in New York, ranging in age from 65-88, self-rated religiosity was the strongest pre-

dictor of life satisfaction. In a study on community-living and institutionalized adults between the ages of 60 and 90, Fry (2000) found that religion- and spirituality-relevant variables, such as personal meaning, religious involvement, spiritual practices, and religious salience, were significant predictors of well-being. Strikingly, these variables were better predictors than variables such as physical health, stressful life events, and social support. In addition, effects of these religious and spiritual variables on well-being were stronger in the institutionalized sample than in the community sample.

Krause (1992, 1993, 1995) has performed several studies on religion and well-being in older adults. His 1992 study looked at some 450 African Americans over age 60. In that study, religiosity was related both to emotional support and to self-esteem, but was unrelated to measures of personal control or depressive affect. In a 1993 study of more than 700 people aged 55 or older in the World Values Survey, data from Americans and Canadians showed that subjective religiosity, and a derived variable relying on five dimensions of religion, were both related positively to life satisfaction. Krause (1995) has shown that relationships between religiosity and self-esteem may be nonlinear among older adults, with self-esteem being highest in those people either low or high on religious involvement, and lowest in older adults with only moderate religious involvement.

The small amount of work on religiosity and well-being among Jews is conflicting. Shkolnik, Weiner, Malik, and Festinger (2001) interviewed elderly Jewish men living in religious neighborhoods in Israel, and found that those who were more traditionally religious reported greater life satisfaction than those who were less religious. However, Iecovich (2001) looked at religiosity and well-being in elderly Jewish women in Israel, and found, after controlling for possible confounds, that religiosity did not seem to be related to well-being.

In terms of prospective studies in older adults, Koenig, McCullough, and Larson (2001) found that two studies showed no associations, whereas four studies showed positive associations. However, for one study (Graney, 1975), there was only a trend for religious attendance at baseline to predict happiness prospectively in a sample of 60 elderly women (r=.14, p=.07). In another prospective study (Blazer & Palmore, 1976), religious activities correlated significantly with happiness cross-sectionally in several time points over the nearly 20-year period of the study. As far as effects of religiosity at baseline predicting future well-being, Markides' (1983) study is perhaps the best prospective evidence. In a sample of Mexican-American and Anglo-Americans from Texas studied over a four-year period, church attendance at Time One was correlated with life satisfaction at Time Two, after controlling for sex, age, marital status, and education. This was true among both ethnic groups.

Branco (2000) examined religiosity and depression in a probability sample of 2,084 residents of 270 nursing homes in 10 states. Complete data were obtained from 1,449 people, most of which were white women (1007) and

men (281). Among white men, religiosity and depression were inversely correlated. In other groups (white women, and black men and women), effects of religion moderated effects of stress, with different groups showing varying relationships between religiosity and types of stress.

On balance, then, the evidence does seem to favor a positive relationship between well-being and religious variables among older adults. But the cross-sectional evidence is more plentiful than the prospective evidence. More prospective studies are especially needed because of the uncertain nature of causal relationships between religiosity and well-being. Levin and Chatters (1998) have laid out five different theoretical models of relationships between religion and mental health, with different causal directions and different mediators. Recognition that the causal direction of a correlation between religiosity and well-being is uncertain goes back at least as far as William James:

> "[W]e must admit that any persistent enjoyment may produce the sort of religion which consists in a grateful admiration of the gift of so happy an existence; and we must also acknowledge that the more complex ways of experiencing religion are new manners of producing happiness, wonderful inner paths to a supernatural kind of happiness, when the first gift of natural existence is unhappy, as it so often proves itself to be" (James, 1902/1997, p. 78).

Depression. Affective disorders such as depression are prevalent in older adults. In community-living people over 65, around 1-3% of them have major depressive disorder at any given time (Regier et al., 1993) and another 6-8% will have significant symptoms but will not meet the full-blown criteria (Blazer, Hughes, & George, 1987). Not surprisingly, chronically institutionalized older adults have a higher rate of depression than community-living older adults—about 10%, with another 20% having significant symptoms (Parmalee, Katz, & Lawton, 1989).

Blazer (2000) recognized that depression in older adults is a result of a complicated interaction of several factors. There may be biological reasons for this, such as structural changes and physiological reactions to stressors, that may make older adults more vulnerable than younger adults to depression. Also, certain social and psychological stressors, such as the loss of a spouse, may also predispose older adults to depression. Conversely, older adults may be less susceptible to depression than younger adults for other reasons, such as greater wisdom and a lesser tendency than younger adults to exaggerate the impact of negative events. Spirituality might be a means through which stressors experienced by older adults are buffered (Blazer, 2000).

A few studies relevant to this discussion identified depressed older subjects and followed them over time, trying to determine characteristics at baseline that predicted resolution of depression up to one year later. A study by Koenig, George, and Peterson (1998) showed that, for medical patients aged 60 and older who were consecutively admitted to the hospital and diagnosed with

depression, greater levels of intrinsic religious orientation predicted shorter times to remission of the depression. In a converging finding from a study on people aged 55-89 in The Netherlands, increased salience of religion was not associated with the incidence of depression, but was associated with recovery from depression (Braam, Beekman, Deeg, Smith, & van Tilburg, 1997). A different study of more than 2,800 persons did show an inverse correlation between depression and religious involvement in an older Dutch sample (Braam, Beekman, van Tilburg, Deeg, & van Tilburg, 1997). These studies point to the possibility that in older adults, religion can be a protective factor against depression, and may also aid in recovery from depression.

In addition to effects of religiosity on mental health, it is also possible that members of certain religions are more or less prone to develop depression. Among 1,855 older adults in the North Bronx, a sample of mostly Jews (about 40%) and Catholics (about 48%), Kennedy, Kelman, Thomas, and Chen (1996) reported several important findings. Jews were disproportionately likely to be depressed at baseline, but were also more likely to develop depressive symptoms over the course of the two-year study, even after age, gender, health, disability, and social support were statistically controlled.

Physical Health

Mortality. Some of the most impressive studies of effects of religious variables on physical health examine the effects of religiosity on mortality (Powell, Shahabi, & Thoresen, 2003). There are compelling differences related to religious group and survival, and also regarding religiosity and survival. Studies on religious affiliation and mortality converge to show that members of certain religions, such as the Amish, Mormons, and Seventh-Day Adventists, and perhaps also Jews, are somewhat longer-lived than members of other religions (Koenig, McCullough, & Larson, 2001).

Complementing this work on differences between religious groups in mortality is research on the effects of degree of religiousness on mortality. Of more than 50 studies reviewed by Koenig, McCullough, and Larson (2001), 39 of them showed that more-religious people outlived less-religious people. Ten studies found no significant relationship. Only one study found that religious people lived a shorter time than less religious people. The results of two studies were somewhat more complicated. Similarly, of 13 studies focusing on the clergy, 12 found that clergy live longer than control groups.

Religious attendance may be another important indicator of religiosity that predicts mortality. Six well-designed, recent studies on religious attendance and mortality, all showed a salutary effect of religious attendance on survival (Glass, Mendes de Leon, Marottoli, & Berkman, 1999; Hummer, Rogers, Nam, & Ellison, 1999; Koenig et al. 1999; Oman & Reed, 1998; Strawbridge, Cohen, Shema, & Kaplan, 1997).

In a more formal review of this literature, McCullough, Hoyt, Larson, Koenig, and Thoresen (2000) performed a meta-analysis of 42 independent samples with a total N of some 126,000 participants. Religiousness was associated with lower risk of all-cause mortality, with an odds-ratio of 1.29 (religious people being 29% more likely to survive than less religious people). Importantly, McCullough et al. (2000) showed that the results do not seem to be explainable either by publishing bias or the file-drawer phenomenon (the presence of a larger number of conducted but unpublished studies showing null results). In a different analysis of studies that met certain standards of methodological rigor, Powell, Shahabi, and Thoresen (2003) also concluded that the evidence is persuasive that religioisty has a protective effect on survival.

Religious attendance may not be the only religious variable that affects survival. Private religious activity may also have an effect. Helm, Hays, Flint, Koenig, and Blazer (2000) performed a six-year prospective study of more than 3,800 older adults who represented a probability sample of community-dwelling older adults in North Carolina. Those who participated rarely or never in private religious activity had an increased risk of dying over the six-year length of the study. Controlling for health variables and demographic variables rendered the difference non-significant in the overall sample. When further analysis divided the sample into people impaired in the activities of daily living (such as preparing food and walking certain distances) and people who were not impaired, an interesting pattern of results emerged. For the impaired group, after controlling for demographic variables, the effect of private religious activity on survival was not significant. For the unimpaired subjects, even after controlling for demographics and health variables, the effect remained significant.

Turning to some of the more specific heath conditions that may explain relationships between religious affiliation or religiosity and mortality, we review studies in older adults on religion and functional ability, cancer, and stroke.

Functional Ability. Several studies show an inverse relationship between religiosity and disability status (reviewed in Koenig, McCullough, & Larson, 2001). As we argued in the context of our discussion of research on religion and well-being, the causal relationships between religion and health are not clear. Levin (1996) pointed out that most evidence is cross-sectional and correlational, so we know with more confidence that religious people are healthier, but we do not know if religion can cause better health. Of the many possible accounts for such a relationship, we will review evidence for two: (a) religiosity is a protective factor against the development or exacerbation of disability; and (b) disability reduces the ability to be religiously active.

To investigate which of these is a stronger account of the relationship between religiosity and disability, Kelley-Moore and Ferraro (2001) analyzed data from a national probability sample of adults 60 years of age and older.

The data came from the Americans' Changing Lives sample, which is a multistage probability sample of more than 3,600 adults. Older adults and African-Americans were oversampled in this data set. Baseline data were collected in 1986 and at least one followup wave has been conducted. Thus data were available at baseline and a three-year follow-up in this sample. Religious service attendance was used as a measure of religiosity. In addition, other religious probes included salience of religious beliefs, frequency of reading religious materials, and watching or listening to religious programming. For these activities, there were six response categories ranging from never to more than once a week.

Functional (disability) status was computed on the basis of self-rated activity limitation (from not at all to a great deal), self-report of whether a participant was bed- or chairbound all day (with a dichotomous response scale: yes or no), and amount of difficulty walking blocks and climbing stairs (rated from no difficulty to being unable to do that activity). Baseline morbidity was calculated on the basis of 10 health conditions, such as stroke, diabetes, and cancer. Social integration was controlled because of robust relationships between social support and health among the elderly (e.g. Idler & Kasl, 1997a, 1997b; Ortega, Crutchfield, & Rushing, 1983). Depression was also controlled for similar reasons. Other co-variates included age, education, total family income, race, and sex. The results showed little evidence for the benefit mechanism. In fact, to the extent that there was a prospective relationship between religious attendance and functional status, the relationship was positive, not negative. Much of the effect of functional limitations on religious service attendance was immediate; the only significant relationships between religiousness and functional status were at baseline.

Other researchers have generated empirical support for the hypothesis that religiosity can cause functional improvements and increased survival. Strawbridge, Shema, Cohen, and Kaplan (2001) examined data from the Alameda County Study, looking at the prediction from religious attendance in 1965 of survival in 1994. Participants were more than 2,000 people between the ages of 17 and 65 who survived until 1994. Their findings suggested that religious attendance at the earlier time point was predictive of survival at the second time point, despite being positively associated with *greater* disability at baseline. Furthermore, the relationship was partly accounted for by increases on the part of religious people in healthy behaviors, mental health, social support, and marital stability.

In another study, Idler and Kasl (1997b) examined data from elderly people in the New Haven EPESE data set (Established Populations for the Epidemiological Study of the Elderly). In a 12-year prospective study, these investigators showed that religiosity was predictive of disability status, and that social ties, mental well-being, and healthy behaviors explained part of the relationship. Furthermore, those data showed little support for the barrier mechanism proposed by Kelley-Moore and Ferraro (2001). While religious attendance

predicted better functional status 6 to 12 years later, disability predicted lower religious attendance only short-term, similarly to what Kelley-Moore and Ferraro reported in terms of effects of disability on religious attendance.

The effect of religiousness on disability status may be partially due to the possibility that religiosity may affect patients' perceptions of disability. Idler (1987) showed that among men with similar objective severity of medical illness, those who were religious reported less disability than did men who were less religious. In 1995, Idler showed that religious people's subjective impressions of their health are not solely a function of their physical health, but that such ratings represent an integration of many variables, including their religious or spiritual well-being.

Stroke. Some work on religion and stroke focuses on rates of stroke in different religious groups. There is evidence that Jewish attorneys in Cleveland and Detroit were less likely than their non-Jewish counterparts to have a family history of stroke (Friedman and Hellerstein, 1968). There is also mixed evidence that Mormons may be less susceptible to cerebrovasuclar disease than are non-Mormons (Jarvis, 1977; Lyon, Bishop, & Nielsen, 1981). In a study of 700,000 residents of Manitoba between the ages of 20 through 64, Abu-Zeid, Choi, Maini, and Nelson (1975) found that Mennonites and Hutterites had the lowest incidence of new strokes in a year-and-a-half long period. Phillips, Kuzma, Beeson, and Lotz (1980) found, in a 12-year prospective study of more than 112,000 Californians over the age of 35, that Seventh Day Adventists were less likely to die due to cerebrovascular disease than non-Seventh Day Adventists. Of the many possible explanations for these findings, differences in health behaviors (such as smoking rates) were used to explain these findings.

In addition to studies suggesting that members of religious groups have different risks of having strokes, there is some evidence that degree of religiosity can be related prospectively to risk of stroke. In a six-year prospective study of more than 2,800 older adults, Colantonio, Kasl, Ostfeld, and Berkman (1993) showed that people who attended religious services at least weekly were less likely to have strokes than those who attended less than weekly (4.7% versus 7.5%). In further analyses, these authors showed that the effect of attendance on stroke likelihood lost statistical significance when controlling for "explanatory factors" such as hypertension, heart attack, and smoking. Therefore, it is likely that religious attendance influences stroke rate by affecting these well-known predictors of stroke such as smoking, hypertension, and other cardiovascular risk factors.

Cancer. Research on cancer prevalence and religious denomination is mixed. In a comprehensive review of religion and cancer, Koenig, McCullough, and Larson (2001) summarized the research as showing that Jews seem to have lower rates of penile cancer than non-Jews, but higher rates of breast or ovarian cancer. Two out of three studies showed Seventh-Day Adventists to have lower rates of lung cancer than non-Seventh-Day Adventists, and two studies

showed Mormons to have lower rates of cervical cancer than non-Mormons. In a study of the Parsis in India, this group had higher rates of breast cancer than members of other religious groups.

Of studies examining relationships between religiosity and cancer mortality reviewed by Koenig, McCullough and Larson (2001), five found that religiosity was associated with a lower risk of cancer mortality (Dwyer, Clarke, & Miller, 1990; Enstrom, 1989; Gardner, & Lyon 1982a, 1982b; Ringdal 1996. Two studies found no relationships (LoPrinzi, et al., 1994; Yates, Chalmer, St. James, Follansbee, & McKegney, 1981).

Several factors may be responsible for differences between members of different religions in cancer rates, and differences between religious and non-religious people, including diet, rates of smoking and drinking alcohol, safer sex practices, genetic factors, psychosocial factors, and hygienic practices may be responsible (Koenig, McCullough, and Larson, 2001). Whether religious groups have different rates of cancer and whether religiosity is protective against developing cancer, religion may also be related to coping in important ways. How effective is religious coping in cancer patients? Fehring, Miller, and Shaw (1997) showed that in a sample of 100 Midwestern elderly people with cancer, intrinsic religiosity and depression were negatively correlated. Hope and positive mood were higher in those with higher levels of intrinsic religiosity and spiritual well-being. Similarly, Koenig, Moberg, and Kvale (1988) showed that in elderly people attending a geriatric outpatient clinic, among those with cancer, religious activity and intrinsic religiosity were lower than in patients without cancer.

Religion may be particularly important to the methods by which certain subgroups in the population cope with cancer. For example, Musick, Koenig, Hays, and Cohen (1998) showed that among elderly, community-dwelling blacks with cancer, religious activity was related to lower levels of depression. People with other illnesses or no illness, and people in other groups, showed no such relationship. Numerous studies show that spirituality is a commonly used coping strategy in women with breast cancer (Carver, et al., 1993; Johnson & Spilka, 1991; Mickley & Soeken, 1993; Mickley, Soeken, & Belcher, 1992). As we have pointed out, the causal directions of these relationships are not entirely clear. It is possible that religious group membership and religiosity are protective factors against the development of cancer. However, it is also possible that someone with cancer finds it more difficult to get to religious services. Cancer may also impact more personal aspects of religiosity, in that being seriously ill can cause a patient to struggle with issues of meaning, religious faith, and justice.

Mediators of Health Effects

We have reviewed two kinds of research: work on differences between members of different religions in likelihood of developing physical and psy-

chological disorders, and work on differences between people of varying levels of religiosity. We will now discuss the mechanisms that could be responsible for such differences. The mediators we discuss below are plausible for both psychological and physical outcomes.

First, however, we make some general comments about what it means to understand "mediators" between religion and health outcomes. We believe that the appropriate scientific stance is that effects of religion on physical and psychological health can be completely understood in terms of the mediators just discussed, including social support, healthy behaviors, and psychological coping mechanisms. If this is so, is religion reduced to the status of the uninteresting? We do not think so, for two reasons. First, even if effects of religion could be completely explained, effects on health of such variables are important enough that we would need to understand religion as a means of producing those health end points. Second, religion is special. Pargament (2002) emphasized that there is something unique about religion, its involvement with the sacred, which is not reducible to mundane mediators. Funder (2002) pointed out that religion addresses ultimate matters which psychology cannot.

That said, what are the likely mediators of religion's effects on health? There are many theoretically likely mediators relevant to the analysis of religiosity and health (e.g. Cacioppo & Brandon, 2002; Ellison & Levin, 1998; George, Ellison, & Larson, 2002; Levin, 1996; Levin & Chatters, 1998). Ellison and Levin (1998) discuss potential mediators between religion and health, arguing that all of the following are possibilities: regulation of lifestyle and healthy behaviors, social resources, positive self-perceptions, coping resources, positive emotions, healthy beliefs, and other (supernatural) causes. From a biological point of view, religiosity may have associations with hypertension, lipid profiles, immune function, and different patterns of brain activity (Seeman, Fagan Dubin, &Seeman, 2003). Another mediator could be a genetic influence; about one-third of the variance in religiosity and spirituality appears to be genetic (Bouchard, McGue, Lykken, & Tellegen, 1999; Waller, Kojetin, Bouchard, Lykken, & Tellegen, 1990; Tsuang, Williams, Simpson, & Lyons, 2002). It is conceivable that some of these genes could also be related to health outcomes.

One potentially crucial mediator between religious variables and both physical and psychological health outcomes is religious coping. There is empirical evidence that religion can be associated with a number of ways of coping. Siegel and Schrimshaw (2002) interviewed 63 older adults, aged 50-68, who were infected with HIV. These adults reported that their religious/spiritual beliefs offered them nine types of coping benefits, including emotional comfort and resilience, social support, reducing death anxiety, and a way of understanding the meaning of their illnesses.

Religious coping is beginning to be recognized within mainstream medicine for older adults (Koenig et al., 2002). Religious coping can be a powerful way for people to find meaning in their life circumstances by feeling that God

is helping them through their problems. However, Pargament has long recognized that religious coping can involve both forms that promote better health and poorer health (Pargament, 1997; Pargament & Brant, 1998). In medically ill older patients, people who reported wondering whether God had abandoned them or thought the Devil was responsible for their illness had a greater likelihood of having died at a two-year follow-up (Pargament et al., 2001).

In past discussions of links between religion and health, variables such as social support have received much attention as an explanatory variable. Links between social and biological variables in the biopsychosocial model are well documented. For example, we have already alluded to the importance of social support as a mediator between religious attendance and health outcomes among older adults, although social support does not explain most of the effect of religion on health (Idler & Kasl, 1997a, 1997b; Koenig et al., 1997; Ortega et al., 1983; c.f. Bradley, 1995; Ellison & George, 1994; George, 1992; House, Landis, & Umberson, 1998; Myers, 1993). Social networks may be especially important in older people because of the special characteristics of these networks: older adults have smaller but more emotionally meaningful social networks and feel closer to the people in them. Socioemotional selectivity theory explains such findings by proposing that, because older people realize that they have a finite amount of time to live, they choose and regulate their social interactions more carefully than younger people do (Carstensen, Isaacowitz, & Charles, 1999). The same theory also proposes differences between younger and older people in emotion regulation, in that older people appear to experience fewer negative and more positive emotions (Carstensen, Isaacowitz, & Charles, 1999). Because less is known about how positive psychological states might mediate between religion and health in older people, we will address that issue.

The role of positive emotions as important mediators in religion-health connections is beginning to appear important (Cohen, 2002; Fredrickson, 2002). Although it may be difficult to imagine how psychological states could influence biological health variables, research is accumulating on how this might occur. In many religions, the worldview is full of optimism and meaning. Such worldviews may have positive health consequences. A review of empirical findings that support this idea follows.

In one classic study on explanatory style and health, Peterson, Seligman, and Vaillant (1988) analyzed the essays of a cohort of almost 100 male Harvard graduates from the classes of 1942-1945. Those men with pessimistic explanatory styles (tendencies to explain bad events in stable, global, and internal ways) had poorer health 20 and 30 years later than did the men who were more optimistic. Health was measured not by the participants themselves, but by physician ratings on a five-point scale. The relationships between health and explanatory style persisted even when physical and mental health were statistically controlled. In another study correlating explanatory style with health outcomes, Reed, Kemeny, Taylor, Wang, and Visscher (1994) studied 78 gay

men diagnosed with AIDS. Those men who had unrealistically optimistic views of their chances of surviving AIDS died on average nine months after those who had more realistic views of their chances of beating AIDS.

Studies of older adults also suggest relationships between psychological outlook and physical health outcomes. In a study on positive self-perceptions and ageing, there was a seven-and-a-half year difference in mortality between those who had positive self-perceptions of ageing and those with negative perceptions (Levy, Slade, Kunkel, & Kasl, 2002). These perceptions were measured up to 23 years prior to death. Positive self-perceptions of ageing in this study meant agreement with items from the Philadelphia Geriatric Center Morale Scale (Lawton, 1975) that captured a sense of optimistic attitude related to the ageing process. In this study, the effects of perception seemed to be mediated by will to live, or a sense that the benefits of ageing outweigh the problems.

In another study on the role of positive outlook on mortality in older adults, Danner, Snowdon, and Friesen (2001) analyzed the autobiographies of 180 nuns entering the convent in their early 20s. The extent of positive emotion present in these autobiographies had a strong predictive effect on mortality some 60 years later, in which those in the top quartile of rankings of positive emotion had a 2.5 times lower risk of mortality relative to those in the bottom quartile.

The strength and comfort that religion provides may also be important in its protective effects on health. After cardiac surgery, elderly people with a lack of strength and comfort from religion, along with a lack of involvement in social or community groups, have an increased risk of dying during the first six months following surgery (Oxman, Freeman, & Manheimer, 1995). The participants in this study were undergoing cardiac surgery for coronary artery bypass grafting, aortic valve replacement, or both. After controlling for biomedical indices, patients who reported that they received no strength and comfort from religion were more than three times as likely to die than were those who reported at least a small amount of such strength or comfort.

Research is now shedding light on how positive psychological states can influence physical health outcomes in impressive ways. Optimism has been shown to be associated with better immune system function—more helper T cells and higher natural killer cell cytotoxicity (Segerstrom, Taylor, Kemeny, & Fahey, 1998). Is religiosity associated with immune system function in older adults? The answer seems to be yes. Two studies have found links between religiosity and immune function. Koenig et al. (1997) found that among people 65 and older, those who attended religious services were 49% less likely than non-attenders to have high IL-6 levels (>5 pg/ml) in plasma. The effect remained significant and only slightly attenuated after statistically controlling for age, sex, race, education, chronic illness, and physical functioning. In a converging finding in people 55 and older, Lutgendorf (personal communication) found a negative correlation between plasma IL-6 levels and religious or spiritual coping.

Given the possibility that religion may promote a healthy worldview, an important topic for future research is to examine ways in which optimism, positive emotion, and a sense of meaning are related to religiosity in older adults. This is not a new idea. Describing reliance on religion in Nazi concentration camps, Frankl (1959) explained that meaning was a key factor in survival. And despite his characterizations of religion as neurotic and a type of wish-fulfillment (Freud, 1927/1962), Freud did acknowledge that "only religion can answer the question of the purpose of life. One can hardly be wrong in concluding that the idea of life having a purpose stands and falls with the religious system" (p. 25).

One aspect of meaning in religion that may be of particular importance to older adults has to do with the meaning of death and dying. Although older adults have less death anxiety than younger adults (Thorson & Powell, 2000), older adults still must confront ultimate questions of the meaning of their lives and deaths, and religion may be an important component of this. Is there empirical support for the notion that religiosity may promote a sense of meaning that reduces death anxiety? The findings are mixed (see Leming, 1980, and Thorson, 1991 for reviews). Belief in the afterlife and in related religious variables has been shown in a few studies to be negatively correlated with fear of death (Aday, 1984-85; Alvarado, Templer, Bresler, & Thomas-Dobson, 1995; Cicirelli, 2002; Ochsmann, 1984; Templer, 1972). However, Thorson and Powell (1989) showed a nonsignificant correlation between a measure of intrinsic religiosity and death anxiety, and Templer and Dotson (1970) found no relationship between religious variables and death anxiety among college students. Osarchuk and Tatz (1973) found that reminders of death, as opposed to other anxiety producing manipulations, were associated with greater reported belief in an afterlife for those participants who were high in religious beliefs before the manipulation. However, Ochsmann (1984) failed to replicate this finding.

A religious point of view in facing death and dying, and, indeed, health in general, could lead to some interesting theological and theoretical questions. Increased longevity has been referred to as a positive aspect of health and as a salutary effect of good psychological states. From a religious standpoint (at least from a Judeo-Christian standpoint), long life is often seen as the reward for virtue. However, for a religiously faithful person, death may not be something to avoid and fear, but something to face with dignity and perhaps anticipation as a gateway to another life.

Although such afterlife ideas may be more familiar in a Christian context, it is also true from the Jewish point of view. It seems a common misconception that Judaism does not teach the existence of an afterlife because of its focus on the here and now. But belief in the afterlife is an important part of Jewish teaching. "Yes, it is accurate to maintain that Judaism has a life-affirming, this-wordly orientation that proclaims the sanctity and significance of physical plane life.... But this does not imply that there is no Jewish belief in an

afterlife. To deny or politely bypass Jewish notions of life after death is a pedagogical error promulgated by all too many instructors of Judaism" (Raphael, 1996, p. 13). In fact, Rabbi Maurice Lamm (2000) wrote, "The conception of an afterlife is fundamental to the Jewish religion.... The denial of an afterlife constitutes a denial of a cornerstone of the faith" (p. 234). However, the details of the afterlife are not clear in Jewish tradition, and Maimonides taught that humans cannot understand the true nature of the afterlife, and so the details are unimportant (Lamm, 2000).

Discussing possible similarities and differences between religions or cultures in worldviews that may impact health leads us into a discussion of possible race, ethnic, and religious differences in the role of religion and spirituality in the biopsychosocial model of health in ageing.

Cultural and Religious Differences

Race and ethnicity could impact these issues in several ways. Such issues need to be investigated in culturally informed and sophisticated ways. One area that has received attention is the relative importance of religion as a coping mechanism in certain minority populations.

Levels of religiosity and social support appear to be greater in African-Americans than in Caucasian-Americans. Religion is even more important in elderly African-Americans than in white Americans (Chatters & Taylor, 1994; Mitchell &Weatherly, 2000). Rosen (1982) showed that religious coping is more common among poor blacks than among poor whites.

Religiosity also seems to correlate more positively with life satisfaction, and more negatively with depression, among African-Americans than among Caucasian-Americans (Coke, 1992; Husaini, Blasi, & Miller, 1999; Musick, Koenig, Hays, & Cohen, 1998). In the Musick, Koenig, Hays, and Cohen (1998) study, for example, effects of religious activities on depression among elderly people with cancer were stronger among blacks than among whites. However, investigators should be careful not to lump all people of one minority together. Levin (1997) points out that the heterogeneity of populations makes it important to look for intra-racial and intra-ethnic differences in religion-health relationships.

In addition to these ethnic differences, levels of religiousness and meanings of religiousness differ in different parts of the world. For example, in certain parts of northern Europe, religion is seldom used as a way of coping with stress, probably reflecting low rates of religious involvement in these countries. One study found that nearly 80% of persons in Sweden indicated "none" for their degree of religiosity (Rudestam, 1972), compared to about 10% in the United States. In a survey of 148 healthy adults from Sweden, Cederblad, Dahlin, Hagnell, and Hansson (1995) found that only 1% used religion as a way of coping with stress. Likewise, in a sample of cancer patients from Norway, Ringdal, Gotestam, Kaasa, Kvinnslaud, and Ringdal (1995)

reported that 43% did not believe in God and 45% received no comfort from religion. Only the Ringdal et al. study, however, focused primarily on older adults.

Different religions and cultures may also promote different views of what it means to be elderly. We can, as we have tended to do in American culture, portray old age as a time of general decline into ill health, senility, and dependence. Alternatively, we can value the wisdom and unique contributions that older adults have to make. We cite as examples of this the role of older people as transmitters of oral history in the American black community (Dancy & Wynn-Dancy, 1994), the value of elders in Asian cultures (Limanonda, 1995; Yamamoto, Silva, & Chang, 1999), and the Hindu tradition in which older people undertake spiritual journeys (Leder, 1996). In a Jewish context, it is a paramount Jewish value to both honor and revere one's parents (Meier, 2000). When parents are older and infirm, children are obligated to care for them or to arrange for others to care for them.

It is also possible that religion-health relationships, and the mediators involved, may differ in different religious communities. Again, religion-health relationships are no doubt influenced by the particular religious worldview of the population under investigation. Comparing Jews and Christians in this regard, for example, may lead to different findings because the religions are different in certain relevant aspects. Whereas Judaism is both a religion and an ethnic group (Morris, 1996; Neusner, 1993), Protestant religions determine membership on the basis of belief. Therefore, belief may be a more salient part of religiosity for Protestants than for Jews. Theologically, Judaism appears to assume, but not clearly command, belief in God. Likewise, there seems to be a large range of acceptable beliefs in Judaism (Ariel, 1995; Encyclopaedia Judaica, 1997; Prager &Telushkin, 1981; Schulweis, 1994). Doubt may be acceptable in Judaism because certain streams of Jewish tradition teach that humans cannot comprehend the true nature of God (e.g. Maimonides, 12th century/1967).

Supporting this hypothesis, in a series of studies, Cohen, Siegel, and Rozin (2003) predicted participants' self-rated religiosity from their levels of religious practice, religious belief, and religious knowledge. For Jews, only religious practice made a significant, unique contribution in a regression model predicting self-rated religiosity. However, for Protestants, both religious practice and religious belief made unique contributions. Similarly, in rating the importance of religious practice and religious belief to being religious, Jews rated practice more important than belief, whereas Protestants rated belief more important than practice. Therefore, religiosity ratings made by Protestants may be more related to belief than for Jews.

If the meaning of religiosity is different for Jews and Christians, it may have implications for relationships of religiosity with health outcomes. This hypothesis is supported by a recent set of studies on relationships between well-being and religiosity/spirituality among Catholics, Jews, and Protestants

(Cohen, 2002). For members of all three religions, social support obtained through religious sources correlated to a similar extent with measures of happiness and life satisfaction. However, for Catholics and Protestants, happiness and life satisfaction correlated very strongly with religious belief, religious coping, and spirituality, whereas they did not correlate strongly with life satisfaction or happiness among Jews (Cohen, 2002).

Given the cultural and religious differences discussed here, it is an important topic for future research to investigate differences between members of varying religions and cultures, as well as within-group differences. Such investigations are currently difficult to carry out as measures of religiosity, such as religious orientation scales (Allport & Ross, 1967), often reflect American Protestant values (Cohen et al., submitted). Indeed, Snibbe and Markus (2002) have recently argued that the field of psychology as a whole has been influenced profoundly by an American, Christian ethos.

General Conclusions and Recommendations

We have attempted in this paper to provide evidence that religion-related variables have important health implications. We have noted that the causal directions are often less clear than the correlations (Levin, 1996). Although mediators such as social support and healthy lifestyles have been recognized for a long time, psychologically relevant mediators are beginning to appear promising in explaining health effects of religion in older adults. When interpreting this research, one should keep in mind appropriate caveats about cultural and religious differences in the ways religion might relate to health outcomes in different populations.

The recommendations for practice based on the body of research we reviewed are not entirely straightforward. Health care providers should attend carefully to theological perspectives. One layer of this has to do with the expertise of health care providers to address spiritual issues, which they may not be competent to do (Lawrence, 2002). However, health care providers may find it helpful to be aware of the religious and spiritual issues facing their patients and be able to make appropriate referrals to deal with these issues. Accreditation requirements for psychiatric residencies now require that training programs include "presentation of the biological, psychological, sociocultural, economic, ethnic, gender, *religious/spiritual*, sexual orientation and family factors that significantly influence physical and psychological development in infancy, childhood, adolescence, and adulthood" (American College for Graduate Medical Education, 1994, pp. 11-12). In psychology as well, residents are required by the American Psychological Association to train in cultural and individual diversity, including religion (American Psychological Association, 1995).

Another theological warning with which we resonate is that one should not interpret the extant evidence to mean that it is necessarily advisable to pro-

mote religiosity or spirituality for the sake of health benefits. There are significant theological problems with the idea of using religion for the sake of health, and of designing experiments that seem to test the existence or intervention of God (Chibnall, et al., 2001; Shuman & Meador, 2003).

Theological perspectives on such issues may also prompt investigators to rethink notions of health in purely biological or psychological terms. We noted work by Idler (1987, 1995) showing that religious or spiritual people do not conceive of their health in purely biomedical terms. Such findings may have implications for interpreting relationships between religion and biomedical health. For example, we cited above a study by Pargament and colleagues (2001) that showed that religious struggle on the part of medically ill, older patients increased their risk of dying. This would seem to indicate in a biomedical perspective that such religious struggle is to be avoided. However, whether such struggle is inadvisable—and, indeed, whether risk of dying is seen as negative—may be theologically interesting questions. For people with strong religious faith, death may be seen as something to be embraced as a new beginning, as opposed to the end of biological life.

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