IS FREQUENT RELIGIOUS ATTENDANCE REALLY CONDUCIVE TO BETTER HEALTH?: TOWARD AN EPIDEMIOLOGY OF RELIGION

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Abstract—Although hundreds of published studies have addressed the effects of religion on morbidity and mortality, many investigators may be unaware of this literature. This paper begins with an analysis of an important subset of these studies—those 27 which operationalize 'religiosity' as religious attendance—and which, taken as a whole, point to a consistent salutary effect for frequent attendance. Upon identifying several pervasive epistemological, methodological, and analytical problems with these studies, however, this paper shows that there is insufficient evidence to conclude that religious attendance is positively and significantly related to health. Nevertheless, the authors present a theoretical basis for expecting such associations. This framework is included in a brief primer on religion and which, taken as a whole, point to a consistent salutary effect for frequent attendance. Upon identifying several pervasive epistemological, methodological, and analytical problems with these studies, however, this paper shows that there is insufficient evidence to conclude that religious attendance is positively and significantly related to health. Nevertheless, the authors present a theoretical basis for expecting such associations. This framework is included in a brief primer on religion

Keywords—epidemiology, religion, measurement, methodology

Scholars from diverse disciplines have long speculated about the effects of religion on human health and well-being. These include theologians such as Paul Tillich [1] and William Clebsch [2], philosophers such as Bertrand Russell [3] and William James [4], and psychologists such as Abraham Maslow [5] and Sigmund Freud [6]. Although these scholars univer-

sally agree that religion exerts a profound influence on health, they greatly disagree as to whether religion has mostly salutary or deleterious effects. The relationship, if any, between religious factors and health outcomes has been a source of intense debate for decades. While religion scholars have naturally shown great interest in this area (e.g. [7, 8]), many prominent clinicians and researchers in the health field, from John Shaw Billings [9] and William Oster [10] to Jerome Frank [11, 12] and Berton Kaplan [13], have also composed their thoughts on potential, empirically verifiable linkages between religion and health.

More importantly, several epidemiologists, most notably Professor George Comstock and his associates at Johns Hopkins, have come to the conclusion that religious factors in epidemiology represents an ongoing scholarly enterprise that accounts for a large portion of the social and behavioral epidemiologic literature. If a study of the literature [17] discovered nearly 250 such studies dating back to the early 19th century in which operational features of religion were investigated as independent variables.

(1) Unbeknownst to many sociomedical scientists and perhaps most epidemiologists, the study of religious factors in epidemiology represents an ongoing scholarly enterprise that accounts for a large portion of the social and behavioral epidemiologic literature. The only review of this literature [17] discovered nearly 250 such studies dating back to the early 19th century in which operational features of religion were investigated as independent variables.

(2) In the overwhelming majority of these studies, the investigation of religion has been confined to comparisons of morbidity and mortality rates across religious groups (e.g. Protestants vs Catholics; Mormons vs non-Mormons; Jews vs gentiles). Religion, per se, has not been treated as a true independent variable. However, in about two dozen of these studies, a measure of religious behavior has been used—the frequency of religious attendance. We will review this subset of the religion and epidemiology literature. In general, these studies suggest that infre-
quent religious attendance should be regarded as a consistent risk factor for morbidity and mortality of various types. We will indicate how this evidence points to a demonstrably salutary effect for religious attendance.

(3) We will then critique these studies and show that their posited associations between religious attendance and health are highly questionable. We will highlight epistemological, methodological, and analytical problems pervading these studies—for example, an overreliance upon uncontrolled analyses—and conclude that clear and significant correlations between religious attendance and health have not in fact been conclusively demonstrated. We will then provide a brief discussion of both good and not-so-good ways to measure religious attendance in epidemiologic investigations.

(4) Despite this lack of strong, demonstrable, empirical evidence linking religious attendance and health, we nonetheless will set forth important reasons for believing that such a relationship is likely operative. Drawing upon scholarship from a variety of disciplines, including the history of religions, philosophy of religion, anthropology, and sociology, we will present a theoretical framework for generating meaningful hypotheses governing associations between religious attendance and health.

(5) Finally, we will indicate how an epidemiology of religion might develop as a field of enquiry, with special reference to those barriers to such a development which are grounded in traditionally accepted disciplinary boundaries and world views.

By now, the discerning reader will have noted that the authors are among those eccentrics who believe that the concerns of *homo religiosus* bear upon psychic and somatic well-being. By the end of this paper, the reader will recognize why we hold to this point of view.

**REVIEW AND CRITIQUE OF EMPIRICAL FINDINGS**

At first glance, the findings presented in Table 1 seem to demonstrate conclusively that epidemiologic studies of religious attendance have shown that religion has a salutary effect on human health. Twenty-two out of 27 studies found the frequency of religious attendance to be significantly associated with health in a positive direction; and, in the four studies reporting insignificant associations [18-21], the authors presented data revealing strong, salutary trends for attendance. In short, it seems clear that frequent attendance is a protective factor against a wide range of illness outcomes.

The validity of this overall finding is strengthened by several factors. First, there are no significant period effects; that is, significant findings have been reported consistently in the literature over almost 30 years. Second, the same result is obtained despite a striking heterogeneity in the way in which the independent variable, religious attendance, is operationalized. Whether dichotomous measures or six- or even nine-category responses are used, the construct is still positively related to health. Third, significant findings have obtained across a great array of outcomes: from cardiovascular-related conditions to cancer, and from psychosocial well-being to behavioral risk factors. These outcomes involve both morbidity and mortality. Finally, while not reported in Table 1, the settings and sample sizes of the studies, as well as the age ranges, genders and ethnicities of the subjects all vary considerably. Yet, despite such variation, the overall finding of a significant, positive association between religious attendance and health remains.

According to this overview, it thus seems that the salutary effects of religious attendance have been identified, that this definitely advances epidemiologic knowledge, and that this overall finding needs to be further publicized and taken seriously. Yet the nagging question remains: Is frequent religious attendance really conducive to better health? First impressions are often erroneous, and in this instance it would be a mistake to curtail discussion as if the data were clear and the issues were settled. As we will demonstrate, it is much too premature to conclude that the literature has proven a salutary effect for religious attendance. In fact, upon examining these studies in greater detail, we will show that this relationship is still very much in doubt.

In critiquing this literature, we will first discuss some general epistemological problems with the conventional ways in which epidemiologists deal with religion. Second, we will discuss the methodological implications of the apparent ‘ghettoizing’ of religion in epidemiologic circles. Third, we will show how this lack of critical attention to religion has been exacerbated even further by inadequate data analyses. Finally, we will suggest how one might go about measuring religious attendance in an epidemiologic or biomedical study.

**Epistemological issues**

Perhaps the central problem with the epidemiologic literature on religious attendance is a haphazard disregard of conceptual and operational issues, coupled with an ignorance of the advances and conventions of the scientific study of religion. Indeed, from the standpoint of psychometric and methodological scholarship in the psychology and sociology of religion, the *status quo* and *au courant* ways of conceiving and measuring ‘religion’ in epidemiologic research are positively primitive.

Epistemological diversity constitutes one of the underlying reasons for this state of affairs—that is, the presence of diverse and clashing world views regarding what is and is not real or knowable among behavioral epidemiologists, social scientists of religion, and religion scholars. To begin, behavioral epidemiology tends for the most part to operate within a positivistic, philosophically materialistic world view. Observable, measurable, discrete behaviors constitute the domain from which independent variables are drawn. Thus, religious commitment or religiosity, if considered at all, is operationalized merely as, ‘How often do you go to church?’ or, worse, ‘Do you ever go to church?’ More frequently, though, religion goes unconsidered; epistemologically speaking, the domain and effects of ‘religious commitment’ are believed to be underivable or unreal or both. Western biomedicine, of which epidemiology is
Table 1. Chronological summary of findings linking religious attendance to health

<table>
<thead>
<tr>
<th>Authors [Ref.]</th>
<th>Operationalization of religious attendance</th>
<th>Dependent variables</th>
<th>Association between religious attendance and health</th>
</tr>
</thead>
<tbody>
<tr>
<td>King and Funkenstein [36]</td>
<td>Parental attendance (regular, occasional, infrequent)</td>
<td>Cardiovascular pattern (epinephrine-like vs nor-epinephrine-like)</td>
<td>+</td>
</tr>
<tr>
<td>Scotch [23]</td>
<td>Yes vs no</td>
<td>Hypertension</td>
<td>-</td>
</tr>
<tr>
<td>Naguib et al. [31]</td>
<td>&gt;1 wk, l wk, &gt;1 mo, 2-12 yr, &lt;2 yr</td>
<td>Trichomoniasis prevalence</td>
<td>-</td>
</tr>
<tr>
<td>Naguib et al. [32]</td>
<td>&gt;1 wk, l wk, &gt;1 mo, 2-12 yr, &lt;2 yr or never</td>
<td>Positive pap smears and cervical cancer incidence</td>
<td>+</td>
</tr>
<tr>
<td>Comstock and Lundin [33]</td>
<td>Parental attendance (regular, occasional, infrequent)</td>
<td>Neonatal mortality rate</td>
<td>-</td>
</tr>
<tr>
<td>Comstock and Partridge [14]</td>
<td>Parental attendance (regular, occasional, infrequent)</td>
<td>TB test sensitivity</td>
<td>-</td>
</tr>
<tr>
<td>Comstock et al. [35]</td>
<td>1 wk, 1 mo, &gt;1 yr</td>
<td>Five-year TB total case rate</td>
<td>-</td>
</tr>
<tr>
<td>Comstock [30]</td>
<td>1 wk vs &lt;1 wk</td>
<td>Risk of ASHHD mortality</td>
<td>-</td>
</tr>
<tr>
<td>Enstrom [38]</td>
<td>1 wk vs &lt;1 wk</td>
<td>Total mortality</td>
<td>-</td>
</tr>
<tr>
<td>West et al. [37]</td>
<td>2+ wk, 1 wk, 1-2 mo, &lt;1 mo, never</td>
<td>Symptomatology and depression</td>
<td>-</td>
</tr>
<tr>
<td>Hannon [39]</td>
<td>Yes vs no</td>
<td>Risk of hypertension</td>
<td>-</td>
</tr>
<tr>
<td>Steinits [25]</td>
<td>(Not reported)</td>
<td>Number of physical, mental, and social symptoms</td>
<td>+</td>
</tr>
<tr>
<td>O’Brien [43]</td>
<td>1 wk, 1 mo, 2-12 yr, &lt;1 yr, never</td>
<td>Cancer incidence rates</td>
<td>NS</td>
</tr>
<tr>
<td>Gardner and Lyon [19]</td>
<td>Very active, active, possibly active, inactive</td>
<td>Alienation in dialysis patients</td>
<td>+</td>
</tr>
<tr>
<td>Clearly and Houts [20]</td>
<td>Yes vs no</td>
<td>Psychophysiological symptoms</td>
<td>NS</td>
</tr>
<tr>
<td>Levin and Markides [45]</td>
<td>1+ wk, 2-3 mo, 1 mo, 4-6 yr, 1-2 yr, never</td>
<td>Total mortality</td>
<td>-</td>
</tr>
<tr>
<td>Levin and Markides [21]</td>
<td>1+ wk, 2-3 mo, 1 mo, 4-6 yr, 1-2 yr, never</td>
<td>Subjective health</td>
<td>-</td>
</tr>
</tbody>
</table>

a part, is still wrestling with a body-mind dualism that defies consensus; thus, for most epidemiologists any resolution of a body-mind-spirit pluralism is simply beyond consideration.

In contrast, many of the increasing number of sociologists and psychologists of religion and social gerontologists who have delved into religion-and-health research may also consider 'religion' as unreal—in the sense that it is not really grounded in some transcendent being, power, or realm. Yet, these scholars do not regard certain aspects of religion as unknowable. At the least, 'religion' is regarded as a subdomain of cognitive and affective realms, so that even if the existence of a spiritual world or spiritual plane is disavowed, variables measuring religious beliefs, feelings, attitudes, and values are viewed as indicators of mental or emotional states. Studies investigating the effects of religion on health, well-being, and the quality of life are part of this wide range of research.

Finally, to many religion scholars, 'religion' is both real and knowable, knowable at least to some degree, and within religious studies, medicine and health are becoming increasingly popular areas of research. Investigations in this area, however, often either fail to utilize empirical methods or they display a lack of sophistication regarding these methods. It is likely that these failures are due more to a lack of collaboration with social scientists and epidemiologists than to a steadfast belief that religious factors cannot be measured.

These contrasting world views suggest why epidemiologists are largely resistant to the development of any 'epidemiology of religion' as an interdisciplinary enterprise—resistant to the degree that many epidemiologists will likely greet this enterprise
with skepticism or even disdain. Behind such attitudes lies a set of epistemological assumptions that are antithetical to any scientific investigation of religion–health relationships. Without attention to the epistemological matters of conceptualizing and operationalizing 'religion' in meaningful ways, no amount of methodological and analytical sophistication will be sufficient to generate meaningful findings.

The positing of one or more epistemic relationships serves as a necessary starting point for any biomedically or social- or behavioral-scientific investigation. Even if the establishment of a perfect or ideal epistemic correlation is elusive, or perhaps inherently impossible, investigators cannot proceed to analyze suggestive data or explore and interpret provocative findings without having first defined a pertinent set of theoretical concepts and then having operationalized these concepts in ways rendering them accessible through measurement. At the operational level, these constructs comprise a set of independent and dependent variables. For any independent variable, then, there are both operational and theoretical planes of meaning. While epidemiologists generally display a mastery of the specialized, arcane knowledge germane to the measurement of health outcomes and selected social and behavioral indices (e.g. type A behavior, depression, occupational mobility, educational attainment, life change, social support, etc.), most, regardless of their own philosophical stance, appear to possess a limited, perhaps highly limited, knowledge-base concerning religion. This has resulted in somewhat naive, sometimes meaningless analyses—an especially unfortunate outcome in light of the infrequency of such well-meaning, but oftentimes ill-conceived, ventures.

**Methodological issues**

Unfortunately, studies of religious factors in health have not been part of a larger research tradition. Most empirical studies treating this relationship have thus been atheoretical. This is evident in many large epidemiologic censuses or investigations in which a stray religion variable has sometimes been included as an afterthought or as a methodological gesture—perhaps as a means for examining the heterogeneity of matched control groups. Such gestures display a lack of awareness of the relevant epistemological issues, and suggestive findings are rarely followed up. Consonant with the empirico-inductive tradition dominant in epidemiology since 'pump handle' days, religion is then usually plugged into a multivariable equation or, alternatively, a simple test of significance is run. The occasional positive findings of such analyses then usually end up being included in the published results of a larger study. This is especially the case with studies comparing morbidity or mortality rates across religious groups (e.g. Protestants vs Catholics vs Jews).

A much smaller group of studies, however, has investigated religion more directly and carefully. These include investigations that focus on religious attendance instead of mere affiliation—a trend in sociomedical research perhaps inspired by Norman Scotch's [22, 23] seminal studies of the effects of religious attendance and bewitchment on hyper-tension among Zulus. In such studies, religious attendance is usually regarded as a proxy for something akin to 'religiosity' or 'religiousness.' While this epistemological assumption will be challenged later, epidemiologists who have operationalized religion as a behavioral variable (e.g. as religious attendance) have at least shown a desire to investigate the health effects of the 'religious' side of human nature, not simply to compare morbidity and mortality rates across religious denominations. Despite a level of naiveté regarding the nearly axiomatic acceptance of the significance of a religious attendance variable, this line of research has nonetheless represented a quantum leap beyond those studies in which religion serves as a stray variable.

Both of these approaches may nevertheless represent only the tip of a research iceberg. We suspect this for the following reasons: (1) epidemiologists analyzing data on religious attendance appear generally to be unaware of each other; (2) since religion–health interconnections are not viewed as a recognized line of research, it is likely that only positive findings make their way into print—in part because they are easily viewed as intriguing and surprising; (3) there may well be hundreds or even thousands of unfruitful (i.e. insignificant) associations involving religious attendance that remain unpublished because such associations were expected and thus unsurprising. In other words, the corpus of positive findings now available may represent only a small portion of actual findings, most of which may lie in drawers and archives of unpublished materials. Positive relationships between health outcomes and religious attendance may thus rest on chance and uncertainty: the notorious 'file drawer problem' [24] that represents a major stumbling block for any reviewer of scientific literature, especially a literature whose very existence may be largely unknown even to its contributors. Regarding this paper's topic, the list of positive results in Table 1 may represent only a very small fraction of the research that has been conducted on the epidemiologic effects of religious attendance. We must stress, however, that this point represents only speculation on our part.

**Analytical issues**

Another serious problem with this literature, and one that is linked to concrete evidence, is the preponderance of zero-order (i.e. uncontrolled) analyses underlying the significant findings reported in Table I. While the methodological issues just broached raise questions as to the veracity of an overall significant and positive religious attendance health relationship, the actual magnitude and statistical significance of the findings that have been published must also be called into question. The most recently published article in Table 1 [21] represents a first attempt to propose a theoretical framework (actually four of them), to engage in hypothesis-testing, and to pay serious attention to the need for higher-order (i.e. controlled) analyses. These are all vitally important issues, because the epidemiologic literature on religion has largely avoided providing explanations for significant, positive associations between health and one or more 'religion' variables based on a theoretical view of religion. For
example, it is important that the phenomena known collectively as ‘religion’ be distinguished from some single effect of religious activity, such as the provision of social support.

Pertinent to this, Levin and Markides [21] found a significant zero-order association between religious attendance and health (an outcome defined by a subjective self-rating of overall health). They then controlled for the effects of social support and social class, yet a significant association between religious attendance and self-rated health remained. This suggested that some sort of religious factor was operative—a factor that still remained even when they removed the effects of subjective religiosity. Finally, though, when they controlled for a measure of activity limitation, the correlation was reduced to insignificance. They concluded that at least among older subjects, the frequency of religious attendance may be a proxy for disability or functional health rather than an indicator of some influence of religion per se—a finding supported by recent work in social gerontology [25–28]. In other words, correlations between health and religious attendance may, in reality, represent correlations between health and functional health (i.e., the capability to get out of bed and go to services). Not surprisingly, such associations between churchgoing activities and health tend to be highly significant in a positive direction. In sum, these findings not only suggest the need to control for these variables may themselves be confounded with health outcomes. In order to clarify these issues further, as well as avoid mistaken associations, epidemiologists seeking useful information on the influence of religious attendance and functional health, we are not implying that no epidemiologist has seriously tackled this issue, nor that it has escaped previous notice. Levin and Markides [21] noted that this very issue—now a popular topic in the field of religious gerontology—was first addressed many years ago by George Comstock, the epidemiologist who has most strongly advocated the use of religion as a meta-construct for epidemiologic research. On at least two occasions Comstock acknowledged that physical capacity is an important explanatory variable in dealing with significant associations between religious attendance and health. Utilizing data drawn from the Washington County, Maryland, investigations of the 1960s and 1970s, Comstock and Tonascia suggested that because a positive association between religious attendance and total mortality disappeared with time, such an association “may have resulted from disabled persons being concentrated among infrequent church attenders” [29]. Comstock also registered this view in a prior paper [30]. This is important, for many of the other papers reviewed here [14, 31–33] also used the Washington County data. In all of these studies, religious attendance frequencies may have been influenced by the health status of respondents.

Nonetheless, although disability may explain the positive findings of the studies just identified, certainty of this is lacking because disability was not controlled for in their analyses of religion. In some of these studies [32, 33], controls for educational attainment were considered—as was also the case in the seminal article by Comstock and Partridge [14]. As Levin and Markides [21] noted, however, disability, rather than education, appears empirically and theoretically to account for seemingly positive relationships between religious attendance and health.

In the remaining studies from Table 1 that found significant, positive associations, the analyses were largely zero-order (i.e., uncontrolled). To the non-social scientist and non-epidemiologist, ‘uncontrolled’ means that tests of association between religion and health variables (e.g., correlations, gammas) or comparisons of health across categories of religion variables (e.g., analyses of variance, chi-square tests) were run without controlling for any factors that could potentially confound such relationships and render spurious any significant findings. A few analyses were low-order (i.e., they had some controls, but no more than a variable or two, such as ethnicity). Examples of these zero- or low-order analyses include a simple chi-square-test [36]; a zero-order correlation or t-test (it is unclear as to which was utilized) in which only P-values are reported [23]; unadjusted rates [37] and rate ratios [38]; a one-way analysis of variance and a zero-order correlation [39]; zero-order gammas [25, 40]; zero-order correlations [41]; zero-order correlations and a bar graph [42]; a one way analysis of variance [43]; and ethnic comparisons [27, 44]. Two studies attempted more sophisticated controls. These included gender and generational comparisons [45] which further specified positive findings, as well as a study [46] controlling for socioeconomic status, smoking, and Quetelet score (an indicator of ponderosity or body mass that somewhat reduced the strength of the finding).

In general, while the above analyses are all definitely suitable and technically correct for answering the epidemiologic questions addressed in these studies, from a social-scientific standpoint they represent insufficient bases for reaching decisive conclusions regarding the health effects of religious attendance. In most of these studies, religious attendance was one of many social and behavioral variables and indices to be correlated with particular health outcomes or disease rates in order to determine which of these variables represented ‘risk factors’—reliable, significant predictors of the dependent variable. In such cases, elaborate statistical controls are often-times not directly relevant to this epidemiologic task at hand. On the other hand, without such controls, it is impossible to reach conclusions regarding the likelihood of causality in religion–health associations. In fairness to these studies, most were not designed to provide answers to questions about the relationship between religion and health. They sought, rather, to identify a list of determinants of some health outcome, and their inclusion of a religion variable was, from the standpoint of empirical religion-and-health scholarship, serendipitous.

Measuring religious attendance

A crucial issue brings together many of the episte-
The literature on religious attendance and health thus appears to suffer from biases operating in opposite directions: as noted previously, the over-reliance upon zero-order analyses coupled with the findings of Levin and Markides [21] suggest that the positive associations in Table 1 may not really be significant at all; yet the typically skewed nature of religious attendance as an independent variable suggests that the positive findings in Table 1 may actually be underestimated and, as such, more important than heretofore realized. While we suspect that the former bias is more critical than the latter, epidemiologists should nonetheless avoid coding schemes that definitely militate against a normally distributed religious attendance variable. This can be achieved with little effort.

An item measuring the frequency of religious attendance could include the following 'on average' scale: more than three times each week, three times each week, two times each week, once each week, two times each month, once on special occasions, rarely, never. Clearly, this classification schema is 'top heavy' compared to conventional breakdowns in epidemiology (see Table 1), and it also does not bother much in distinguishing degrees of less-than-monthly attendance. Furthermore, the proliferation of categories at the 'high' end can always be collapsed if the population under survey produces empty or low-count cells in the direction of very frequent attendance. In the absence of such response options, though, the health effects of very frequent attendance are impossible to ascertain. Finally, additional attendance to special religious classes and meetings could be measured on a simpler scale: more than once each week, once each week, once or twice a month, a few times a year, rarely, never.

Two final points merit mention. First, the term 'religious attendance' is preferable to 'church attendance,' because the members of many religious groups (e.g., Jews, Muslims, Buddhists, etc.) do not attend 'church.' This is more of an issue in religiously heterogeneous areas, such as India, but, even in the U.S. or Europe, inquiring as to 'religious,' instead of 'church,' attendance is a more sensitive phrasing and is less likely to alienate Jewish and other non-Christian respondents. While there are probably no published psychometric data on this point, it is wise not to take chances with built-in biases.

Second, once data on religious attendance are gathered, the investigator should not attempt to add scores on this item to other items ostensibly dealing with 'religion' in order to create a summary index of 'religiousness.' While this might make perfect sense to an epidemiologist untrained in religious studies, this approach is as incongruous as summing data on social class, social support, and social environment (e.g., crowding) in order to produce a single index measuring the effect on health of things 'sociological.' Such a religiousness index was created in one recent study [53] by summing weighted scores on religious attendance, subjective religiosity, and religion as 'a source of strength and comfort.' Just what this new meta-variable might actually mean is unfathomable. Richard Gorsuch [54], an expert in the measurement of religion, has been especially critical of such 'hodgepodge' scales which take liberties in mixing up beliefs, values, and reports of behavior when measuring 'religion.' In an essay on religion and mental health, Talcott Parsons once warned, 'It is an elementary mistake to assume that everything bearing the semantic label of 'religion' can be dealt with as one phenomenon' [55]. That the items of such a general religiousness index have anything at all to do with each other (beyond each containing the word 'religion') and that such an index has a common meaning for Protestants, Catholics, and Jews, are both highly dubious and unsubstantiated. Epidemiologists who create such indices are to be congratulated for including such variables in their study.
but, unfortunately, an amalgamation of these variables negates the opportunity to study their effects in a meaningful way.

We will now explain why there are numerous dimensions to human religiousness [56], how the meaning and salience of each of these dimensions varies considerably according to the religious tradition of the subject or respondent, and how these phenomena have important implications for epidemiologic research. Our discussion reflects certain fundamental perspectives currently paradigmatic in the scientific study of religion, and represents a kind of summary primer on religion for epidemiologists and other interested sociomedical researchers.

**DISCUSSION**

**A brief primer on religion for epidemiologists**

From the standpoint of contemporary religious studies, one can expect uncertain or meaningless answers to emerge from questions designed to compare the health status of persons by Protestant vs Catholic vs Jewish affiliation or on the basis of their attending religious services either once a week or less frequently. This is true because these broad religious heritages encompass a variety of specific traditions that differ greatly both in regard to the value they place on religious attendance and in regard to the ideals they have and the practices they advocate regarding that which is conducive to or disruptive of physical and emotional health [57]. At the same time, it is also very conceivable that interesting and meaningful associations can be established between health status and religious attendance.

How is it possible to justify these seemingly contrary expectations? In order to justify this, we will posit a theoretical framework for thinking about interconnections between religion and health. This framework is built around the following topics: (1) what religion is and how this relates to religious attendance; (2) how particular religious traditions vary with respect to their greater or lesser emphasis on common characteristics of religion—in particular, beliefs, rituals, and experiences; (3) how religious traditions vary with respect to the emphasis they place on human health in general and on certain health practices specifically; and, (4) how meaningful and accurate associations between religion and health can be established only if questions are asked that elucidate both the shared and particular features of religious traditions.

First, religion has been identified with particular beliefs about gods or some divine principle, with certain emotions or reverential dispositions (piety), with ethics tinged by emotion, with rituals surrounding sacred objects, and so on (see, e.g., [58]). Rather than viewing these features as exclusive, they should be regarded as inclusive of one another, namely as interrelated “religion-making characteristics” [59]. Each historical and institutionalized religious tradition represents a respective clustering of the following features: a world view (or comprehensive picture of the nature and purpose of human existence in the world and cosmos); belief in some superempirical, usually supernatural being(s), power(s), or realm; distinctions between realms of the sacred and the profane; rituals and ceremonious behavior (such as prayer, meditation, recitations, and eating) [60]; moral codes; characteristic motivations and emotions (such as awe, guilt, and adoration); and, social organizations. Within religions, these features are interdependent, in that rituals, for example, represent and utilize symbolic actions and objects that elicit certain feelings, reflect beliefs, and display and perpetuate some overarching understanding of the world (a world view or weltanschauung) [61].

As *ipso facto* inclusive and integrative of beliefs, feelings, acts, and institutions, religion can hardly be reduced to one aspect of these features—for example, belief in God, a feeling of dependence, or the practice of regularly attending religious services. In this sense, the meaning of religion is somewhat analogous to the meaning of ‘life style,’ in that each concept represents a clustering of features rather than some identifiable ‘factor’ (i.e. a thing or isolatable entity). Not surprisingly, just as the meaning of ‘life style’ has been perverted in sociomedical and epidemiologic research to mean just that—an isolatable, atomistic factor, such as not wearing seat belts [62]—so, too, has the meaning of ‘religion’ been linked to such purportedly unidimensional factors as ‘Do you believe in God,’ or, ‘How often do you go to church?’ Interestingly, though, while the practice of religion must not be conceptually reduced to attendance at religious services, such attendance (in the context of the beliefs and practices of the traditions under investigation) often represents a short-hand way to assess how often persons participate in several of the important and characteristic features of a religion. This is true because religious services are social rituals. and, as just suggested, through rituals religious traditions affirm and enact their beliefs and world views, instill valued moods and motivations, and identify prescribed and forbidden courses of action.

Although the above characterization of religion is a necessary starting point for empirically investigating religion and offers insights as to how attending religious services unites several features of religion, this first set of perspectives is but a prelude to our next two topics, which lead us to focus on increasingly specific knowledge about particular religious traditions and which remind us that an accurate characterization of religion *per se* is essentially an abstraction based upon an understanding of particular expressions of religion. Our second topic represents a greater level of specificity than the first; namely, it considers how religious traditions vary in patterned ways as to what common features of religions—notably beliefs, rituals, and emotions—are accentuated. It is instructive, for example, to view religions as more or less representative of one of these types: sacramental, prophetic, and mystical [59].

Sacramental religions focus upon that which is sacred as expressed or symbolized through natural things—objects, places, personages, food, drink—and upon human actions and behaviors pertaining to these. Rituals lie at the energizing center of sacramental religions. They symbolically manifest and maintain beliefs, and they are symbiotic with and conducive to prescribed emotional responses. Sacramental traditions accent the actions of religious participants, actions both within religious services and
Prophetic religions locate that which is sacred primarily in human utterances (the holy Word) rather than through manifestations of nature. The actions, characters, and teachings of inspired persons are captured in sacred texts, the response to which should be acceptance (faith and confession) and obedience. Rituals center on reciting, reflecting on, and celebrating the meaning of the Word; this nurtures normative attitudes and feelings, as well as ethical reflection.

Mystical religions focus on instilling particular experiences to the degree that rituals, creeds, sacred books, and natural objects may be viewed as "paltry substitutes" to ineffable experiences of the sacred [59]. Contemplative exercises for the purposes of uniting with and identifying the divine are prioritized beyond doctrine, ethical criticism, and social rites.

Within this typology, more particular expressions of religion can be identified. Judaism, Mormonism, and many Protestant groups [Lutherans, Calvinists (Reformed), Methodists, and so on] are characteristically prophetic, traditional Catholicism. Greek and Russian Orthodoxy, and many folk religions are characteristically sacramental; and, Quakerism (the Friends) and many Eastern religions are characteristically mystical. We emphasize 'characteristically' because long-standing religious traditions allow for expressive pluralism—for example, the Kabbalistic and Hasidic traditions within Judaism nurture inward and mystical piety [63], as do certain contemplative religious orders within the broader Catholic tradition. While each of these expressions satisfies the features of the general definition of religion set forth above, prophetic religions center upon belief, sacramental upon ritual, and mystical upon experience. Yet even within these sacramental, prophetic, and mystical categories, significant differences in belief, experience, and action are maintained.

Consider, for example, how prophetic religious traditions variously value attendance to religious services. For traditions that are more alienated from the common culture—such as Jehovah's Witnesses, the Churches of Christ, and most Holiness churches—attendance at three services per week is expected of the faithful. For others, like Orthodox Jews and Mormons, regular attendance is expected, but home and small group meetings are frequent and normative. For lay Lutherans, Episcopalians, Presbyterians, and Catholics, weekly attendance is indicative of committed membership. Without knowing about the particular emphases, expectations, and cultural identities of such traditions, epidemiologists cannot accurately assess the meaning of the more or less frequent attendance reported by adherents of these respective groups.

Furthermore, depending upon the type of religion being examined or the types of religions being compared, certain aspects of religious behavior, experience, and belief are more relevant than others as indicators of "religiosity." More specifically, studies of subjects belonging to largely prophetic religious traditions might best focus on cognitive items ('Do you believe in such-and-such?'), studies of members of mostly sacramental faiths on behavioral questions ('How often do you do such-and-such?'), and studies of members of primarily mystical religions on affective (attitudinal) queries ('Have you ever felt such-and-such?'). As a case in point, a study of Sufis or Reform Jews or Pukkumina practitioners, for example, that seeks to ascertain the effects of religious commitment on, say, cancer mortality by means of a single item measuring the frequency of attendance at religious services would simply be misguided.

The third topic of this primer—how religious traditions vary with respect to their emphasis on health generally and certain health-related practices particularly—raises a host of additional issues. From an epidemiologic standpoint, a lack of awareness of these features of religion may mask potential selection biases regarding health status, behavior, and beliefs. Judaism and Catholicism, for example, have long legacies as to what is permissible or impermissible with respect to medical interventions (medical ethics), while the former (through Kosher laws) regulates diet and hygienic measures in ways that are variously related to health far more than in the latter [64, 65]. Although Kosher regulations represent laws for faithful Orthodox Jews, the word 'law' connotes far more than might meet the eye. In brief, these laws are understood as essential components of the holy Word given by God to those chosen to represent Him and bear the blessings and burdens of His image and will; they are conditions for holiness over against profanity and pollution; they serve concretely to distinguish between the people of God and surrounding peoples and nations; and, they are symbols of oneness and faithfulness to one's forebears.

Other prophetic religious traditions equate health-perpetuating practices with faithful and holy living. Having identified holiness with healthy diets, habits, and hygienic measures, as well as with piety and prescribed doctrine, John Wesley [66], for example, established 18th-century notions of health as one of the hallmarks of Methodism and its historic offshoots—notably Holiness and Nazarene churches. Wesley set forth his view in contrast to the mainline Protestant churches surrounding him [67]. Emerging in the heyday of 19th-century American health campaigns, Mormons and Seventh-day Adventists forbad alcoholic beverages, coffee, tea, and tobacco, and championed natural, wholegrain foods, as well as hard work and exercise. These practices were regarded as distinguishing marks of these religious traditions compared to others [68, 69]. Christian Science and its institutionalized cousins focused their energies on developing alternative forms of healing rather than alternative patterns of diet and hygiene [70]. Other groups like Catholics, Episcopalians, Lutherans, and Presbyterians fostered no specific health religious services would simply be misguided.

In light of these brief examples, it is clear that data on frequency of religious attendance collected from those who identify themselves broadly as Jewish, Catholic, or Protestant mask, rather than highlight, meaningful contrasts and comparisons. To ask whether religiosity, generally construed, is either more or less conducive to human health appears to be like asking whether religion influences political
involvement or political alignment. The answer is likely to be a quick, 'That depends,' or a 'yes and no' that immediately calls for many qualifications.

Might not general measures of religious commitment nevertheless capture whether persons have reasonably healthier, more integrated, less-stressed lives? This (also) depends. It depends upon whether religion as such fosters degrees of security, serenity, purpose, power, and happiness. This raises complex questions related to the fundamental dynamics behind the very existence of—indeed the stubborn persistence of—religious traditions in human culture. Specialists in religious studies, be they anthropologists, sociologists, historians, or theologians, appear to agree on the following general perspectives: religions are created, reformed, and perpetuated because through them groups of persons: (a) make sense of and feel relieved and rescued from inevitably baneful, chaotic, and tragic features of life—natural disasters, misfortunes, aging, sickness, suffering, violence, and death; (b) make sense of and strive to control certain of life's urges or drives, frustrations, and limits; and, (c) seek to secure measures of personal and social significance, control, comfort, serenity, power, aesthetic pleasure, and, sometimes, ecstasy. Religions, therefore, exist in order to address and come to grips with common but, nevertheless, uniquely human needs and strivings, for the vast majority of humans are either unable or unwilling to view themselves as merely insignificant, helpless, and confused in the face of life's puzzlements, uncertainties, and cruelties [1, 58, 60, 61, 71].

In light of these dynamics, it is possible to view religion generally as contributing to human physical and psychological well-being [72]. Whether this is actually true, however, depends upon numerous factors related to the psychological and social effects of religion. Consider, for example, whether the integrated world views of religious traditions are or are not integrative of one's life in a given society. This depends, of course, upon the ways particular world views and those who espouse them are related to the dominant society. Even if specific religious groups like Christian Scientists or certain Holiness sects hold to a coherent understanding of the world that evokes common feelings, acts, and commitments within the community of believers, such groups can be at such odds with the beliefs and practices of the surrounding culture that considerable stress is born by many of its adherents. In this light, frequent religious attendance could represent a protective, self-defense measure fostered more by such factors as guilt-ridden attempts to hold onto the faith of one's ancestors than by a joyful celebrating of an integrated understanding of human existence in world and cosmos. For such groups, a high score on a religious attendance variable might, therefore, be related inversely to health and well-being. Among social epidemiologists, Kaplan first explicitly acknowledged how religious attendance can in some instances be construed as a risk factor [13]. Interestingly, there is a strong tradition within the Bible that regards faithfulness to divine commandments and ethical standards as antithetical to social integration and psychological ease (e.g., Isaiah 32:9-13, Amos 6:1-6, Matthew 10:34-39, 1 John 2:15-17 and 5:19).

In contrast to the examples just cited, belonging to such groups as Orthodox Jews, Mormons, and the Amish may well foster psychological peace and a sense of social integration even though they value beliefs and practices not shared by the dominant culture. They may do this, for example, because they cluster in geographical enclaves or because they hold to certain culturally dominant values (like the patriotism and commercial entrepreneurialism of Mormons). A useful exercise for epidemiologists who have focused on Mormons and Seventh-day Adventists might be to compare the mortality rates of Utah Mormons to other Mormons, and those of California Adventists to other Adventists. Would religious practice and residence at the "center" [73] of one's faith have synergistic effects on the health of sectarians? For religious groups by and large symbiotic with dominant cultural values and institutions—Episcopatians, Presbyterians, the United Church of Christ (Congregationalists), and so on—regular religious attendance may well reflect unusual degrees of value-integration and assurance, and hence serve as conducive to better health. These examples serve to illustrate our overall perspective: without taking into consideration the particular circumstances, beliefs, and patterns of feeling and practice of respective religious groups, meaningful correlations between health and attendance are questionable. Once such factors are considered, however, we suspect that significant and interesting relationships are likely to emerge.

This concern with context brings us to the fourth of the topics outlined above—the sorts of data needed in order to elucidate the religious dimensions of religion—health interconnections. We propose that at least the following data are needed and that they all relate to the three topics just discussed: particular religious affiliation, including denomination or body (i.e. African Methodist Episcopal Zion or Lutheran Church-Missouri Synod, not just Methodist or Lutheran, or Protestant, or Christian); geographical location and duration of residence there; current age and age at baptism, christening, confirmation, conversion, salvation, Bar Mitzvah, kundalini awakening, 'opening,' or whatever; frequency of religious attendance; frequency of additional attendance to religious classes, functions, meetings, revivals, etc. and their specific content; self-rated religious commitment; and, a multidimensional religiosity scale relevant to the religious tradition of the respondent.

For the reasons previously discussed, an item seeking the respondent's particular religious affiliation should include a checklist of major denominations within Judaism, Catholicism, Protestantism, and other groups that do not view themselves in these categories (such as Mormons, Eastern religious groups, and so on). Geographical location and duration of time there give the researcher important clues to integration and cohesiveness (e.g. Orthodox Jews in New York City, Mormons in Utah, Church of Christ members in Texas, Christian Scientists in Boston). Because community-relatedness and involvement are intrinsically stressed by such groups, and because this affects the extent to which the prescribed ideals and feelings of the group are instilled and nurtured, such a measurement should be...
viewed as a factor intrinsic to, rather than separate from, religious identity. There are also issues related to religious isolation: neither a Parsi living in Alaska nor a Yoruba in London, for example, is likely to reap any health-related benefits from a by-and-large non-existent weekly religious fellowship.

Additionally, although generally recognized as fundamental and critical as an epidemiologic variable, age provides additional perspective on members of religious groups undergoing major ritual or ideological change—such as Catholicism since Vatican II and Mormonism since 1979 (in reference to its Black adherents [74]). Finally, an item on religious commitment might be worded as follows: 'Compared to other members of my denomination, I consider myself: more religiously involved and committed; involved and committed like most of those in my denomination; involved and committed, but less so than the majority of fellow members; not very involved or committed.' These data would (a) allow the investigator to work within the framework of particular definitions of religiosity; (b) avoid vague comparisons made by respondents about other, often misunderstood 'religious' persons; and (c) avoid putting those who are highly religious vs-a-vs their group in the double-bind of rating themselves as highly religious or committed when at the same time such a rating is usually equated with pride and hypocrisy.

Finally, while a single subjective religiosity item would be useful, and is in fact conventional in social gerontological research into religion [73], the best way to tap the fullness of religious experience and expression is through some sort of multidimensional scale. The scientific study of religion is replete with such scales, the two most widely used being, first of all, adaptations of the work of Glock and Stark [51] and Faulkner and DeJong [76] on five postulated dimensions of religiosity (experiential, ideological, ritualistic, intellectual, and consequential), and, more recently, derivations and adjustments of Gordon Allport's [77] notions of "intensified" and "institutionalized" religiosity, subsequently termed the "intrinsic" and "extrinsic" orientations (see [78, 79]). For more information on measuring 'religiousness,' the interested epidemiologist or sociomedical scientist is referred to an excellent recent article [54], an edited volume [80], the chapter on religious attitudinal indices in ISR's volume on social psychological attitudes [81], and representative issues of Journal for the Scientific Study of Religion, Review of Religious Research, and Sociological Analysis.

A scenario for the development of an epidemiology of religion

The successful development of an epidemiology of religion into a scholarly, scientific subdiscipline calls for the combined efforts of investigators from a variety of fields. This essay, for example, is the work of a social epidemiologist with additional training in religion, sociology, and public health, and a professor of medical humanities trained in history, religious studies, and ethics, and teaching in a medical school. Such a collaboration may be unusual, but such joint ventures are absolutely requisite to the meaningful conduct of epidemiologic research into the effects of religious factors. That such alliances seem unusual, perhaps even utopian within the confines of segregated institutional structures, serves to underscore the barriers inhibiting this type of research.

In our discussion of epistemological issues, we noted that epidemiologists and religion scholars tend to have differing views of the world, and that these world views have important implications for the value invested in empirical religion-and-health research. Furthermore, we noted that empirical social scientists of religion—sociologists, psychologists, and gerontologists, primarily—may occupy a sort of middle ground between these camps. Assuming these observations are correct, we believe that it is more likely to expect religion scholars to become interested in participating in empirical health-related research than to expect most epidemiologists to become interested in considering religious factors on a systematic basis. This is borne out by the facts that only a select number of dedicated individual epidemiologists has advanced research on the epidemiology of religion, while issues involving medicine and health have become areas of increasing interest to a growing segment of faculty in religion departments and divinity schools. Institutes, conferences, edited volumes, and even journals with a health-related focus and tailored to an audience sensitive to the varied and influential roles of religion in human life (e.g. Journal of Religion and Health) are appearing in accelerating numbers.

Furthermore, unlike the place of religion in epidemiology, the place of discourse on health and illness in religious studies represents a cutting-edge for the field, capable of attracting the best minds and brightest young scholars. Nevertheless, whereas religion scholars could probably handle operational and measurement issues with great sophistication, without the collaboration of epidemiologists and social scientists they would be unable to design and execute first-rate studies.

Given the lack of enthusiasm on the part of epidemiologists for investigating the health effects of religion, coupled with the lack of research-design and statistical knowledge among scholars in religious studies, social scientists can serve as invaluable linkages. Many social scientists have acquired research skills surpassing in complexity and depth those of epidemiologists, and some are manifesting a growing interest in the relationship between religion and health. In fact, two fields of study—social gerontology and quality-of-life research—have recently begun showing an interest in religion-health relationships. In addition, a growing number of sociologists have developed content subspecialties in both medical sociology and the sociology of religion. Since medical sociologists already conduct a large proportion of research currently identifiable as social and behavioral epidemiology, empirical religion-and-health research will flourish if this "alliance" between medical sociology and the sociology of religion, about which Bryan Turner spoke several years ago [82], continues to develop. Similar alliances would be fruitful among other kindred social scientists, such as health psychologists and psychologists of religion.

Finally, religion departments and seminaries are addressing health-related matters with increasing seriousness. Many graduate programs in religion, as
well as many pastoral training programs, offer elective courses and seminars in religion and health. Courses in religion and psychology reflect a longstanding scholarly enterprise. Church-based medical programs are exciting developments of recent years. And, having emerged as a discipline during the last 15 years, the field of medical ethics includes specialists in religious studies, is receiving great attention from religious leaders, and is alerting religious traditions to their extensive past involvement in medical and health-related issues.

A next logical step is for interested religion students and seminarians to obtain research skills by participating in research projects and by taking coursework in the methods of data collection and analysis.

Given these trends among epidemiologists, sociomedical scientists, specialists in religious studies, and leaders of religious traditions, interdisciplinary efforts like the one behind this paper are not so unlikely after all. Such alliances will enable future researchers to explore this area with the seriousness its earliest proponents—Russell, James, Freud, Tillich, and others—believed it deserved.

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