Published in final edited form as:
Int J Psychol Relig. 2010 October ; 20(4): 267–287. doi:10.1080/10508619.2010.507695.

God-Mediated Control and Change in Self-Rated Health

Neal Krause
University of Michigan

Abstract

The purpose of this study was to see if feelings of God-mediated control are associated with change in self-rated health over time. In the process, an effort was made to see if a sense of meaning in life and optimism mediated the relationship between God-mediated control and change in health. The following hypothesized relationships were contained in the conceptual model that was developed to evaluate these issues: (1) people who go to church more often tend to have stronger God-mediated control beliefs than individuals who do not attend worship services as often; (2) people with a strong sense of God-mediated control are more likely to find a sense of meaning in life and be more optimistic than individuals who do not have a strong sense of God-mediated control; (3) people who are optimistic and who have a strong sense of meaning in life will rate their health more favorably over time than individuals who are not optimistic, as well as individuals who have not found a sense of meaning in life. Data from a longitudinal nationwide survey of older adults provided support for each of these hypotheses.

Keywords

God-mediated control; meaning in life; optimism; health

A convincing body of research suggests that people who are more involved in religion tend to have better physical and mental health than individuals who are less involved in religion (Koenig, McCullough, & Larson, 2001). However, explaining how these potentially beneficial effects arise has proven to be a significant challenge. The problem arises primarily because religion is a complex multidimensional phenomenon (Fetzer Institute/National Institute on Aging Working Group, 1999) and, as a result, it is difficult to determine which facets of religion may be at work. For example, some investigators have suggested that use of religious coping responses may be an important factor (Pargament, 1997), others have pointed to the social relationships that people maintain in religious settings (Krause, 2008), while yet other investigators have maintained that religiously motivated forgiveness is especially noteworthy in this respect (McCullough, Pargament, & Thoresen, 2000).

A persistent problem in research on religion and health involves how to integrate religious beliefs into conceptual models of a manageable size (Krause, 2008). This is an important task because researchers have maintained for decades that beliefs may be the most important dimension of religion. For example, in the process of identifying the key dimensions of religion, Stark and Glock (1968) turned first to religious beliefs. The difficulty in studying religious beliefs in research on religion and health arises from the fact that there are so many of them. One way to deal with this challenge is to begin with a particular religious behavior (e.g., church attendance) and identify the specific religious beliefs that are associated with it. Assessing

Address all communications to: Neal Krause, Department of Health Behavior and Health Communication, School of Public Health, University of Michigan, 1415 Washington Heights, Ann Arbor, MI 48109-2029. Phone: (734) 763-5583; fax (734) 763-7379; nkrause@umich.edu.

different combinations of specific behaviors and beliefs across a series of studies provides a more systematic way to gain greater insight into the relationships among religious behaviors, religious beliefs, and health.

The purpose of the current study was to implement this strategy by delving more deeply into the interface between the frequency of church attendance and a religious belief that have not been studied extensively B God-mediated control beliefs (Berrenberg, 1987). Church attendance was selected as the focal religious behavior because the impetus for a good deal of the research has come from studies which suggested that more frequent church attendance is associated with better health (Koenig et al., 2001). It is difficult to provide a concise definition of God-mediated control because this construct has been labeled and defined in different ways. For example, Schieman and his colleagues introduced the notion of divine control (Schieman, Pudrovska, & Milkie, 2005), whereas Murray, Goggin, and Melcarne (2006) examined God locus of control, and Krause (2005) assessed God-mediated control. No attempt will be made to reconcile these different perspectives here. Instead, the current study will focus on God-mediated control. Krause (2005) defined God-mediated control as the belief that God actively works together with people to influence the course of events in their lives. It is important to emphasize that these events may involve undesirable stressful events, but they also include relying on God for help in reaching desired goals and executing beneficial plans.

In the process of assessing the interface between church attendance and God-mediated control beliefs, the current study was designed to contribute to the literature in two potentially important ways. First, data from a longitudinal nationwide survey of older adults were analyzed in order to see if God-mediated control is associated with change in physical health status over time. Research on physical health outcomes is needed because investigators have paid relatively little attention to it. Instead, the majority of studies have examined an array of other outcomes. For example, Krause reported that stronger God-mediated control is associated with a range of outcomes including greater life satisfaction, greater optimism, greater feelings of self-worth, and less death anxiety (Krause, 2005). Schieman and his associates found that individuals with a stronger sense of divine control experience less psychological distress than people who were less certain that God controls the things that happen in their lives (Schieman, Pudrovska, Pearlin, & Ellison, 2005). Other investigators reported that a greater sense of God control is associated with the greater use of beneficial coping responses (Welton, Adkins, Ingle, & Dixon, 1996). Goggin et al. (2007) examined whether God control beliefs influence health behaviors. More specifically, these investigators found that stronger God control beliefs are associated with a lower probability of engaging in risky sex practices (e.g., having fewer sexual partners). And even when physical health outcomes have been used, researchers have assessed domain-specific measures of God-mediated control, such as God locus of health control (Wallston et al., 1999).

The second goal of the current study was to develop and test a conceptual model that examines intervening variables that help explain *how* the frequency of church attendance and God-mediated control beliefs influence change in physical health status. This issue has been largely overlooked in the literature. Even so, identifying and evaluating the intervening constructs that link the frequency of church attendance and God-mediated control with health is important because the staking out the underlying theoretical process is necessary for demonstrating causality. As Bradley and Schaefer (1998) cogently argued, "… a claim of causality is fundamentally interpretive. Its credibility depends on the presentation of a mechanism that substantial numbers of people find compelling" (pp. 166-167). Consistent with this view, an emphasis was placed in the analyses that follow on the ways in which meaning in life and feelings of optimism mediate the relationships between the frequency of church attendance and God-mediated control beliefs on change in health over time.

God-Mediated Control and Change In Physical Health

The latent variable model that was developed for this study is presented in Figure 1. Two steps were taken to simplify the presentation of this conceptual scheme. First, the elements in the measurement model (i.e., the factor loadings and measurement error terms) were not depicted in this figure. Second, the effects of age, sex, marital status, and education were controlled statistically when the model was actually estimated. Eliminating these demographic variables from Figure 1 makes it easier to read.

The main conceptual thrust of the model that is presented in Figure 1 is captured in the following linkages: (1) Older people who attend church more often are more likely to have a strong sense of God-mediated control than older adults who do not go to worship services as often; (2) older individuals with strong God-mediated control beliefs are more likely to develop a strong sense of meaning in life, and they are more optimistic than older people who do not feel that God is helping them control the course of events in their lives; and (3) older adults with a strong sense of optimism and meaning in life rate their health more favorably over time than older individuals whose sense of optimism and meaning is not as strong.

The discussion that follows is divided into three sections. The theoretical rationale for the relationships that are discussed above is presented in the first section. Second, the data for this study were provided by older adults. Consequently, it is important to briefly reflect on why the relationship between God-mediated control and health is evaluated among people in this age group. Third, as noted above, the relationships in the model depicted in Figure 1 were estimated after the effects of several demographic indicators were taken into account. Education was among them. A vast number of studies have examined the relationship between religion and health (see Marmot & Wilkinson, 1999) but relatively little effort has been made to see if education can contribute to this literature (for a notable exception, see Schieman et al., 2005). The potentially important influence of education is examined in greater detail in section three.

Church Attendance and God-Mediated Control

There are at least two reasons why attending worship services may enhance an older person's sense of God-mediated control. First, messages and lessons that are embedded in sermons may underscore the advantages of working together with God to solve problems and reach goals in life. The same messages may be reinforced through hymns as well as congregational prayers that are often part of formal worship services. Evidence that participation in church services may strengthen religious beliefs is found in the work of Stark and Finke (2000). Referring to religious beliefs as “religious explanations,” these investigators proposed that, “Confidence in religious explanations increases to the extent that people participate in religious rituals” (Stark & Finke, 2000, p. 107).

Second, the influence of church attendance on feelings of God-mediated control may not be restricted to participation in formal activities alone. Findings from a number of studies suggest that God-mediated control beliefs may also be influenced by the informal interaction with fellow church members (Krause, 2008). Research by Krause (2007a) indicates that spiritual support may be especially important in this respect. Spiritual support refers to assistance provided by coreligionists for the explicit purpose of increasing the religious commitments, beliefs, and behaviors of a fellow church member. Spiritual support may be exchanged in a number of different ways. For example, church members may share their own religious experiences with fellow parishioners, or show them how to apply their religious beliefs in daily life. Although measures of spiritual support were not available in the current study, it is still possible to indirectly observe the influence of this construct by focusing on church attendance. Krause (2007a) further reported that people who attend church more often tend to receive more spiritual support from fellow church members. If church attendance is associated with spiritual

support, and spiritual support is not measured in the current study, then the effects of this type of church-based support should be captured in the direct effect of church attendance on feelings of God-mediated control.

God-Mediated Control and Meaning in Life

There has been considerable debate in the literature over how to define meaning in life (Wong & Fry, 1998). It is not possible to resolve this longstanding issue in the current study. Instead, the widely-cited definition that is provided by Reker (1997) will be used as a point of departure. He defined meaning as "… having a sense of order, and a reason for existence, a clear sense of personal identity, and a greater social consciousness" (Reker, 1997, p. 790). Because researchers cannot agree on how to define meaning, it is not surprising to find there is little consensus on how it should be measured. Even so, most investigators would agree that meaning is a complex phenomenon that encompasses a number of different dimensions. The work of Krause (2004) is used in the current study to conceptualize and measure a sense of meaning in life because he identified a number of the key components of this elusive construct. Drawing on the classic research of Battista and Almond (1973), he suggested that a sense of meaning in life is made up of four factors: Having values, a sense of purpose, goals, and the ability to reconcile things that have happened in the past.

The way in which God-mediated control beliefs forge a deeper sense of meaning in life may be found by extending the insightful work of Ward (2000) and Smith (2000). In the process of defining the nature of religion and religious communities, Ward layed the motivational foundation for deriving a sense of God-mediated control. More specifically, he argued that, "A religious community, then, may be seen as a group that defines itself in terms of a set of canonical beliefs about the ultimate powers and values that bound human existence, traced back to a founding authority, with a set of practices sustaining appropriate relations to those powers and values. For such groups, the main and important purpose of human life is to establish such a relation" (Ward, 2000, p. 18). He went on to point out that a sense of meaning arises from "… taking the 'transcendent' to be of supreme value, and the highest purpose of life (involves) sustaining a living relation with it" (Ward, 2000, p. 18). Two points in this discussion should be examined closely. First, the emphasis placed by Ward (2000) on the values and sense of purpose in life that is instilled by involvement in religion directly corresponds with the dimensions of meaning that were identified by Krause (2004). Second, Ward argued that the acquisition of these core elements of meaning arise from having a close relationship with "the founding authority" or the "transcendent" (i.e., God). But, as Smith (2000) pointed out, merely aligning oneself with the source of purpose and values in life does not go far enough. Instead, he maintained that people need "… to feel/experience life's meaning, not just acknowledge what sounds to them like its abstract rationale" (p. 259). Simply put, the core religious insights that provide meaning in life are realized only when they are integrated into daily experience. Taken together, the work of these investigators suggests that a sense of meaning arises from aligning oneself with the "founding authority" of purpose and values and then exercising these virtues in real life. A core premise in the current study is that working together with God to reach goals and influence the course of events in life represents an important way in which a religiously motivated sense of meaning can be actively experienced in life.

God-Mediated Control and Optimism

There appears to be only one study in the literature that has assessed the relationship between feelings of God-mediated control and optimism. Krause (2005) found that stronger feelings of God-mediated control are associated with more optimism. The underlying theoretical rational that explains this relationship is relatively straightforward. Barna (2002) conducted six nationwide surveys between 1992 and 2002. He reported that between 75% and 83% of the

older people who participated in these surveys described God as "… the all-powerful, all-knowing perfect creator of the universe who rules the world today" (p. 52). Moreover, research by Stark (2008) indicates that 76% of adults of all ages believe that God is concerned with their personal well-being. So, if older people believe that God is all-powerful, that He cares about their well-being, and that He is working together with them to control the events they encounter, then they should feel quite optimistic about the future.

Meaning in Life and Self-Rated Health

Research by Krause (2004) revealed that older people with a strong sense of meaning in life rate their health more favorably than older people who do not have a strong sense of meaning in life. Similar findings were reported by Steger and his colleagues (Steger et al., 2009). There are at least three ways in which a strong sense of meaning in life may enhance the physical health status of older adults. First, people who have a strong sense of meaning in life are more likely to avoid detrimental health behaviors, such as cigarette smoking (Thege et al., 2009) and they are more likely to engage in beneficial self-management practices when illness is encountered (Cicutto, Brooks, & Henderson, 2004).

Second, research indicates that people who do not have a strong sense of meaning in life are more likely to experience a range of psychological problems, including a higher level of depressive symptomatology (e.g., Krause, 2007b). This is important because a number of investigators have shown that people who have mental health problems tend to have more physical health problems, as well (Cohen & Rodriquez, 1995).

Third, an intriguing study by Bower, Kemeny, Taylor, and Fahey (2003) revealed that meaning in life may be linked directly with physiological changes in the body. Their work indicated that women who experienced an increased sense of meaning in life subsequently experienced an increase in natural killer cell cytotoxicity, which is an important marker of successful immune functioning. Research reviewed by Salovey, Rothman, Detweiler, and Steward (2000) showed how the beneficial effects of meaning on immune functioning arise. These investigators reported that positive emotions have beneficial effects on a wide range of immune functioning measures, including secretory immunoglobulin A, lymphocyte proliferation, and natural killer cell activity. The central role of positive emotions is important because there is some evidence that they are a key byproduct of the meaning-making process. As Reker (2000) pointed out, a sense of meaning in life generates a number of positive emotions including "… feelings of satisfaction and fulfillment (that) individuals get from their experiences and from achieving their goals. Although the pursuit of individual happiness may not result in meaningfulness, whatever is meaningful must provide satisfaction to the pursuer" (p. 42). If meaning generates positive emotions and positive emotions have a beneficial effect on immune functioning, then it is easier to see why older adults who have a strong sense of meaning in life may have better health than older people who do not have a strong sense of meaning in their lives.

Optimism and Self-Rated Health

A number of studies have demonstrated that older people who are optimistic tend to have better health than older adults who are pessimistic. Perhaps the most convincing findings come from studies on mortality. For example, Peterson and his colleagues found that individuals who were more optimistic had lower odds of dying over a 35-year period than people who were less optimistic (Peterson, Seligman, & Vaillant, 1988). There are at least three potentially important pathways that may explain the relationship between optimism and health.

First, there is some evidence that people who are optimistic tend to cope more effectively with stress than individuals who are not optimistic. Insight into the inner workings of this

relationship is provided by Aspinwall (2000). She reported that individuals who are optimistic process health-risk information more effectively as the level of threat from a stressor increases. And she found that ultimately, the ability to process this kind of information is associated with more active coping efforts in the early stages of the coping process. Second, as with meaning in life, there is also some evidence that a strong sense of optimism is associated with better health behaviors. For example, a study by Giltay et al. (2007) revealed that older men with a high level of optimism were more likely to engage in physical activity, they were more likely to avoid smoking, and they consume more fruit, vegetables, and whole-grain bread than older men who were not optimistic. Third, there is some evidence that a sense of optimism may also have a positive influence on immune functioning. For example, research by Grant et al. (2008) indicates that older adults who were more optimistic tend to have enhanced T cell-dependent immune responses.

As shown in Figure 1, self-rated health is assessed at two points in time. This makes it possible to address an important issue involving the amount of time it takes for the potentially beneficial effects of God-mediated control, meaning in life, and optimism to become manifest (i.e., the causal lag). First, the effects of these key constructs on self-rated health may arise relatively quickly. If this is true, then there should be a significant relationship between the baseline measures of God-mediated control, meaning in life, optimism, and self-rated health. This is referred to in the literature as a contemporaneous effect (Kessler & Greenberg, 1981). In addition, it is possible to see if the baseline measures of God-mediated control, meaning, and optimism are associated with change in self-rated health over time. Evidence of this type of effect would be found if these key mediated variables are associated with self-rated health at the follow-up interview controlling for self-rated health at the baseline. The between round interval in the current study (i.e., the time between the baseline and follow-up interviews) was two years. Assessing both contemporaneous and lagged effects makes it possible to see if the effects of God-mediated control, meaning, and optimism are manifest quickly, or whether two years must pass before the influence of these variables becomes evident.

God-Mediated Control in Late Life

Feelings of control have been assessed in a number of ways (Krause, 2003). However, the wide majority of studies focus on feelings of personal control. Individuals who have a strong sense of personal control believe changes in the social world are responsive to their own choices, efforts, and actions. Simply put, people with a strong sense of personal control believe that they can actively influence the course of events in their lives entirely on their own. But a growing body of research suggests that this may not always be possible as people go through late life. In fact, findings from a number of studies have indicated that feelings of personal control decline as people move through the life course (Mirowsky, 1995). Moreover, this research has revealed that the decline in personal control is especially precipitous in late life. A key challenge for researchers is to explain how older people handle age-related losses in personal control. Some insight into this issue was provided by Krause (2008). He maintained that some older people grapple with the loss of personal control by asking God to help them manage the events that arise in their lives, as well as the plans and goals they hope to attain. Put another way, feelings of God-mediated control compensate for age-related loss of personal control. If people are more likely to rely on God-mediated control as they grow older, and if God-mediated control beliefs promote more favorable self-rated health, then it makes sense to look for these health-related benefits in samples comprising older adults.

Education, Religious Involvement, and Health

Education is often used as a core measure of social class and socioeconomic status (SES). A substantial literature indicates that people who are highly educated tend to be in better health than individuals who have completed fewer years of schooling (e.g., Mirowsky & Ross,

2003). However, in delineating the reasons for this well-documented finding, relatively little attention has been paid to the influence of religion. For example, Mirowsky and Ross (2003) failed to mention religion at all. This state of affairs is consistent with the observations of Wuthnow (2003), who noted that, "Social class, perhaps curiously, has received less attention in studies on religion than one might have imagined, given the continuing importance of social class as a reality…." (p. 24). Fortunately, Schieman and his colleagues have assessed the relationship between SES and a sense of diving control (Schieman et al., 2006). These investigators reported that lower SES was associated with a greater sense of divine control, suggesting that this key set of religious beliefs may serve as a potentially important source of resilience for less educated individuals. The analyses that are provided below aimed to replicate and extend this finding by seeing whether a strong sense of God-mediated control benefits lower SES elders by enhancing their sense of meaning in life and optimism.

Based on the discussion that has been provided up to this point, the following core hypotheses served as the focal point in the analyses presented below:

1. More frequent church attendance is associated with stronger feelings of God-mediated control.
2. Lower levels of educational attainment are associated with greater feelings of God-mediated control.
3. Stronger feelings of God-mediated control are associated with a greater sense of meaning in life.
4. A stronger sense of God-mediated control is associated with greater optimism.
5. Greater meaning in life is associated with more favorable health ratings.
6. Greater optimism is associated with more favorable health ratings.

Methods

Sample

The data for this study came from a nationwide longitudinal survey of older adults. The population for this study was defined as all household residents who were noninstitutionalized, English-speaking, 65 years of age or older, and retired (i.e., not working for pay). In addition, residents of Alaska and Hawaii were excluded from the study population. Hawaii was excluded because it would have been prohibitively expensive to establish a field office there. Similarly, the cost of locating and interviewing people in rural areas of Alaska would have been substantial.

Altogether, six waves of interviews have been conducted in this study. However, the analyses presented below are based on the Wave 5 and Wave 6 data only because questions in religion were not administered until Wave 5. As a result, information on Waves 1 – 4 are only summarized briefly. Greater detail on the sampling for this study may be found in Krause (2004).

Data for the Waves 1 – 4 interviews were collected between 1992 and 2003. The sample size at Wave 4 was 1,518. A fifth wave of interviews was completed in 2005. A total of 1,166 of the Wave 4 study participants were successfully re-interviewed. Not counting those who had moved to a nursing home or died, the re-interview rate for the Wave 5 survey was 83.9%.

Wave 6 was completed in 2007. A total of 1,011 older people were re-interviewed at this time. Not counting older adults who had moved to a nursing home or older people who died, the re-interview rate for Wave 6 was 76.9% of those older people who participated at Wave 4.

The analyses provided below are based on the portion of the sample who completed the Wave 6 survey (N = 1,011). Full information maximum likelihood estimation (FIML) was used for any incomplete data among this subset of cases (Enders, 2001). Simulation studies have suggested that the FIML procedure is preferable to listwise deletion because listwise deletion may produce biased estimates (Enders, 2001). In addition, research has further indicated that FIML produces estimates that are quite similar to estimates provided by more time-consuming multiple imputation procedures (Graham, Olchowski, & Gilreath, 2007). Preliminary analysis of the imputed data suggests that the average age of the study participants at Wave 5 was 76.5 years (SD = 6.4 years), 37% were older men, 56% were married at the time of the Wave 5 interviews, and their average level of educational attainment was 12.2 years (SD = 3.3 years).

Measures

Table 1 contains the measures of the core constructs contained in Figure 1. The procedures that are used to code these items are provided in the footnotes of this table.

Church attendance—The frequency of church attendance was assessed at the Wave 5 interviews with a single item that asked study participants how often they attend religious services. A higher score denotes more frequent church attendance.

God-mediated control—Feelings of God-mediated control were measured at Wave 5 with three items. The first two indicators were taken from the work of Berrenberg (1987). The third item was devised especially for this study using the extensive item-development strategy that is discussed by Krause (2002). The items are coded so that a high score reflects a stronger sense of God-mediated control.

Meaning in life—Meaning in life wais assessed with a shortened version of the scale devised by Krause (2004). This abbreviated index was created by conducting a confirmatory factor analysis (not shown here) and selecting two indicators that best measure each of the four dimensions of meaning that were identified earlier (i.e., having values, a sense of purpose, goals, and reconciling the past). Each pair of items was summed to create four observed indicators of meaning in life. The correlation between the short and long version of the meaning scale is .979 ($p < .001$). The measure of meaning in life comes from the Wave 5 survey. A high score represents a strong sense of meaning in life.

Optimism—As shown in Table 1, optimism was measured with three items. The first two items come from the scale developed by Scheier and Carver (1985). These items assess whether study participants always look on the bright side of things and whether they expect the best in uncertain times. The third indicator was developed by Krause (2002). This item deals with feeling confident that the rest of one's life will turn out well. A high score on all three items, which were administered at Wave 5, stands for more optimism.

Self-rated health—Three indicators were used to measure self-rated health. Identical measures were administered in both the Wave 5 and Wave 6 interviews. These widely used survey measures asked study participants to rate their overall health, indicate how satisfied they are with their health, and compare their health to people of their own age. A high score represents more positive assessments of health.

Demographic control variables—As noted earlier, the relationships among the constructs in Figure 1 were assessed after the effects of age, sex, education, and marital status were controlled statistically. The Wave 5 measures of these demographic variables were used for this purpose. Age is measured continuously in years and education reflects the total number of

years of schooling that were completed successfully. In contrast, both sex (1 = men; 0 = women) and marital status (1 = married at Wave 5; 0 = otherwise) were scored in a binary format.

Results

The findings from this study are presented below in three sections. The first section contains information on how the model with the best fit to the data was selected. Then, data on the psychometric properties of the study measures are provided in section two. Finally, the substantive study findings are presented in section three.

Assessing the Fit of the Model to the Data

The model depicted in Figure 1 was evaluated using Version 8.71 of the LISREL statistical software program (du Toit and du Toit, 2001). Because self-rated health is measured at two points in time, two important issues involving the measurement of this construct were addressed so that the model with the best fit to the data can be identified. The first had to do with seeing whether the measurement error terms for identical indicators of self-rated health are correlated over time. Preliminary tests (not shown here) reveal that the measurement error terms are significantly correlated over time (a table containing the results of these findings is available from the author). The second issue had to do with assessing factorial invariance over time (Bollen, 1989). Tests for factorial invariance involve seeing whether the elements of the measurement model (i.e., the factor loadings and measurement error terms) for the self-rated health indicators are the same over time. Preliminary tests (not shown here) indicate that both the factor loadings and the measurement error terms are invariant over time.

As discussed earlier, the FIML procedure was used to handle item non-response. When this procedure is used, the LISREL software program provides only two goodness-of-fit measures. The first is the full information maximum likelihood chi-square statistic (chi-square = 369.760; with 151 degrees of freedom; $p < .001$). The second is the root mean square error of approximation (RMSEA). The RMSEA estimate for the final model that was evaluated in this study is .038. As Kelloway (1998) points out, estimates below .050 represent a very good fit to the data.

Psychometric Properties of the Observed Indicators

Table 2 contains the factor loadings and measurement error terms that were derived from estimating the study model. These coefficients are important because they provide preliminary information about the psychometric properties of the multiple item study measures. Kline (2005) recommended that items with standardized factor loadings in excess of .600 tend to have reasonably good reliability. As the data in Table 2 indicate, the standardized factor loadings range from .582 to .953. Only one coefficient was below .600, and the difference between this estimate (.582) and the recommended value of .600 is trivial. Consequently, it appears that the measures that are used in this study have good psychometric properties.

Although the factor loadings and measurement error terms associated with the observed indicators provide useful information about the reliability of each item, it would also be helpful to know something about the reliability for the multiple item scales as a whole. Fortunately, it is possible to compute these reliability estimates with a formula provided by DeShon (1998). This procedure is based on the factor loadings and measurement error terms in Table 2. Applying the procedures described by DeShon to these data yield the following reliability estimates for the multiple item constructs in Figure 1: God-mediated control (.958), meaning in life (.846), optimism (.854), self-rated health (Wave 5) (.820), and self-rated health (Wave 6) (.837). Taken as a whole, these estimates suggest that the measures that are used in the current study have an acceptable level of reliability.

Substantive Findings

Table 3 contains the substantive findings that were derived from estimating the model that was developed for this study. These results reveal that older people who go to church more often tend to have stronger feelings of God-mediated control than older adults who do not attend worship services as often (Beta = .520; $p < .001$). The findings further suggest that older people with a strong sense of God-mediated control tend to have a greater sense of meaning in life (Beta = .279; $p < .001$) and they are more optimistic (Beta = .347; $p < .001$) than elders who do not feel that God helps them control the events that arise in life. And older adults who have a stronger sense of meaning in life (Beta = .174; $p < .001$), as well as older people who are more optimistic (Beta = .310; $p < .001$) tend to rate their health in a favorable manner at the Wave 5 interviews. However, the same is not true with respect to the self-rated health at Wave 6 (meaning Beta = .062; *n.s.*; optimism Beta = .023: *n.s.*). This pattern of findings suggests that instead of taking time to unfold, the potential health-related benefits of meaning in life and optimism tend to become manifest fairly quickly.

The data in Table 3 also suggest that education exerts a significant influence on all the measures in the study model. One of these relationships suggests that religion may serve as a source of resilience for older adults with fewer years of schooling. Just as Schieman et al. (2006) reported, the findings from the current study indicate that older people with less education are more likely to believe that God helps them control the events that arise in life than older adults who have completed more years of schooling (Beta = -.103; $p < .001$). When combined with the other results in Table 3, the following chain of relationships emerged from the data: older people with less education have a stronger sense of God-mediated control, older adults with a stronger sense of God-mediated control tend to be more optimistic and they also have a greater sense of meaning and life, older individuals with a greater sense of meaning and optimism have more favorable health (at Wave 5).

Although the results that have been reviewed up to this point are consistent with the theoretical framework that was developed for this study, two additional findings were not anticipated. As the data in Table 3 reveal, older people with a strong sense of God-mediated control are less likely to rate their health in a favorable way at either the Wave 5 (Beta = -.183; $p < .001$) or the Wave 6 (Beta = -.079; $p < .05$) interviews. However, in order to interpret these results properly, it is important to place them within the context of additional findings that have not been presented up to this point.

One of the advantages of working with latent variable models arises from the fact that it is possible to turn to additional ad hoc analyses involving the indirect and total effects that operate through a model. A simple example helps clarify the meaning of these terms. The model depicted in Figure 1 specifies that feelings of God-mediated control affect meaning in life and optimism, and meaning as well as optimism, in turn, are associated with self-rated health. This means that God-mediated control may affect health through meaning in life and optimism. When this direct effect of God-mediated control on health is added to the indirect effects that operate through meaning and optimism, the resulting total effect provides a broader vantage point for assessing the influence of this construct. Breaking down the total effects of a construct into direct and indirect effects is known in the literature as the decomposition of effects (Alwin, 1988).

Table 4 contains a complete decomposition of effects for the main constructs in this study. Examining these results provides greater insight into the relationship between God-mediated control and self-rated health. The data that are provided in Table 4 indicate that the indirect effects of God-mediated control on health at Wave 5 that operate through meaning in life and optimism are statistically significant (Beta = .156; $p < .001$). When these indirect effects are added to the direct effect, the resulting total effect of God-mediated control on self-rated health

at Wave 5 is not statistically significant (-.183 + .159 = -.027; *n.s.*). The same is true with respect to the total effect of God-mediated control on self-rated health at Wave 6 (-.079 + .009 = -.070; *n.s.*). However, care must be taken when interpreting these results. It is *not* appropriate to conclude that God-mediated control, therefore, fails to exert a statistically significant effect on health. Instead, the data suggest that the relationship between these constructs is complex and that God-mediated control both enhances (via the indirect effect) as well as diminishes (via the direct effect) self-rated health in late life.

Four additional sets of decompositions add greater depth to the study findings. First, the data provide some insight into how church attendance may influence a number of the intervening variables in the model. More specifically, the findings reveal that attending worship services more often may indirectly influence an older person's sense of meaning in life. The direct effect in Table 4 suggests that older people who go to church often tend to derive a stronger sense of meaning in life (Beta = .195; $p < .001$). However, as the findings further indicate, more frequent church attendance is associated with stronger God-mediated control beliefs, and greater God-mediated control is, in turn, associated with a deeper sense of meaning in life (i.e., the indirect effect of church attendance on meaning is also statistically significant: Beta = .145; $p < .001$). When the direct and indirect effects are summed, the resulting total effects of church attendance on meaning are also significant (.195 + .145 = .340; $p < .001$). Viewed another way, these results suggest that nearly 43% of the total effect of church attendance on meaning in life may be attributed to the indirect effects that operate through God-mediated control (.145/.340 = .426). This means that to a large extent, involvement in religion fosters meaning by enhancing an older person's sense that God is helping them control the course of events in his or her life.

The data in Table 4 provide further insight into the way in which involvement in religion may help older people become more optimistic. The direct effect that is reported in Table 4 suggests that more frequent church attendance is associated with a stronger sense of optimism (Beta = .114; $p < .001$). Moreover, the results further indicate that more frequent church attendance is associated with stronger God-mediated control beliefs, and greater God-mediated control is, in turn, associated with more optimism (Beta = .181; $p < .001$). When this indirect effect is viewed in conjunction with the total effect (Beta = .294; $p < .001$), it can be seen that fully 62% of the relationship between church attendance and optimism arises because attendance at worship services bolsters an older person's sense of God-mediated control (.181/.294 = .616).

The three decompositions that have been presented up to this point all have to do with the influence of church attendance in the study model. Viewing the overall indirect and total effect of church attendance on the health-related summarizes how the model that was developed for this study helps explain why more frequent church attendance is associated with better health in late life. The findings presented in Table 4 suggest that 30% of the total effect of church attendance on health at Wave 5 and 84% of the total effect of health at Wave 6 is explained by the intervening constructs in Figure 1.

The fourth decomposition of effects also provides a succinct summary of how the model that was developed for the current study helps explain the pervasive influence of education on health in late life. The results in Table 4 reveal that 26% of the total effect of education on self-rated health at Wave 5 and 67% of the total effect of education on self-rated health at Wave 6 operate indirectly through the religiously-oriented constructs that are contained in the study model.

Conclusions

A great deal of attention has recently been given in the media to escalating health-care costs. A good deal of this concern has arisen from the fact that older people consume a disproportionately large amount of these expenditures. Recent estimates reveal that the average

health-care expenses in 2005 for people aged 65 and over were nearly three times that of individuals under the age of 65 (Centers for Disease Control and Prevention, 2008). Although these findings are alarming, they provide a golden opportunity for researchers who study the relationship between religion and health in late life to demonstrate how the work they do contributes to one of the most challenging issues of our time. The results that emerge from the current study begin to show why this may be so. The data from this nationwide longitudinal survey of older adults indicate that more frequent church attendance at Wave 5 is associated with more favorable self-ratings of health at Wave 5. Moreover, the findings indicate that church attendance also exerts a potentially beneficial indirect effect on change in health at Wave 6. But more importantly, the results reveal that God-mediated control plays a pivotal mediating role in these relationships. Viewed broadly, the data indicate that feelings of God-mediated control that arise from participating in worship services shape an older person's sense of meaning in life as well as his or her feelings of optimism. This is important because the findings further indicate that a stronger sense of meaning in a life and greater optimism are, in turn, significantly associated with health, especially when the contemporaneous effects are taken into account.

Even though the results from this study have provided important insights, some challenging questions also emerged. The findings suggest that when the indirect effects that operate through the model are examined, feelings of God-mediated control appear to be associated with more favorable health ratings. But when the direct effect of God-mediated control on health is assessed, the opposite conclusion emerges. This negative relationship is present in both the cross-sectional (i.e., contemporaneous) and longitudinal (i.e., lagged) estimates of God-mediated control on health. The longitudinal findings are compelling because the estimate of God-mediated control on health at Wave 6 was obtained after the effects of health at Wave 5 were controlled statistically. This suggests that there may be something about God-mediated control that leads older people to view their health in a less favorable way. It is imperative to find the reason for this unanticipated result. One potentially important explanation comes to mind. When the theoretical rationale for the current study was presented, it was proposed that feelings of God-mediated control help compensate for the well documented loss of personal control in late life (Mirowsky, 1985). Perhaps the shift from being wholly in control of life to sharing control with God brings disadvantages as well as benefits. On the positive side, greater God-mediated control beliefs help bolster and maintain optimism and it promotes a stronger sense of meaning in life. But over and above these benefits, disadvantages may arise because the decline of personal control may be especially difficult for the current cohort of older adults to handle. For some time, gerontologists have argued that the current cohort of older adults value independence highly and they are reluctant to accept help from others (Lee, 1985). Many of the participants in the current study came of age during the Great Depression. Meredith and Schewe (2002) refer to these individuals as the Depression Cohort. In their extensive review of marketing research, Meredith and Schewe (2002) forcefully conclude that, “Maintaining independence is a top priority for the Depression Cohort. They fear losing their independence more than they fear dying” (p. 73). Perhaps having to rely on God instead of taking care of things on their own triggers these underlying fears and confronts older people with inescapable proof that their ability to remain independent is slipping away. And if Meredith and Schewe (2002) accurately portray the importance of living independently, then specter of losing independence may have adverse consequences for their health.

Although the negative direct effect of God-mediated control on health raises a vexing issue, it is nevertheless useful because it demonstrates that more work needs to be done before researchers can get a firm grasp on the nature of God-mediated control beliefs and the ways in which this key facet of religion may influence health. But regardless of how this issue is resolved, unanticipated findings highlight yet another advantage of working with latent variable models. These conceptual schemes do more than just test theory. Instead, they

contribute to the theory generating process by pointing to new questions and hypotheses that help guide future research.

In the process of looking ahead to other studies, care should be taken to address the limitations in the current research. Five shortcomings are discussed below. First, even though the data for this study were gathered at two points in time, the direction of causality can only be determined with studies that utilize a true experimental design. This has implications for the way the study findings should be viewed. In this study it was proposed that God-mediated control affects health, but one might just as easily argue that poor health influences an older person's sense of God-mediated control. Similarly, it was proposed in the model for this study that meaning in life and optimism influence health. But once again this causal ordering could be reversed by specifying that older people who are in good health are more likely to be optimistic and more likely to have a deeper sense of meaning in life than older adults with poor health.

Second, more work is needed on the measurement of God-mediated control. The items in the current study assess whether people believe that God works together with them to resolve problems and reach desired goals. But this belief rests on the assumption that the individual and God agree on what needs to be done. This may not be true because God may not always agree with what an older person wishes to accomplish. Moreover, God may thwart an older individual's goals for the greater good of that person. Finding ways to assess these finer nuances of God-mediated control beliefs will be challenging, but developing sound measures of these issues should help researchers gain deeper insight into the nature of God-mediated control and the relationship it may have with health.

Third, the component of meaning in life that deals with reconciling the past is also in need of further development. As it stands, the items in this scale ask older study participants if they have been able to come to terms with events that have arisen in that past. But information was not obtained on the magnitude of this task. This is important because some older people may have to grapple with fewer events than others. Determining the amount of effort that went into reconciling the past may provide further insight into the relationship between meaning and health in late life.

Fourth, as the descriptive data for feelings of God-mediated control reveal, the measure o this construct is skewed. More specifically, the majority of older people in this study believe that God works together with them to confront challenges and accomplish goals in life. Viewed in a more technical way, this means that the variance in the God-mediated control measures may be somewhat restricted. This situation is sometimes referred to as the base rate problem (Schmitt & Colligan, 1984). Empirical research on the base rate problem reveals that when the range of responses to a measure is restricted, the correlation between that measure and other variables in a model will be suppressed. Consequently, it is important to reflect on the implications of this potential problem for the findings that have been presented above. If restricted variance lowers the size of the correlation between measures then, if anything, the coefficients provided above are conservative (i.e., underestimated).

Fifth, a number of potentially important mechanisms were identified to explain how meaning in life and feelings of optimism may influence health (e.g., beneficial health behaviors), but these intervening linkages were not evaluated empirically in this study. Directly testing these linkages is essential for the development of greater confidence in the model that is depicted in Figure 1.

Down through the ages, scholars from a range of disciplines have wrestled with the notion of whether individuals should rely on themselves or God to confront the challenges they encounter and set the course their lives will take. In the process, some of these scholars have unwittingly discussed the notion of God-mediated control. One such scholar was Josiah Gilbert Holland,

who was a popular nineteenth-century physician and author. One of his widely read works was *Lessons in Life: A Series of Familiar Essays*, which was written under the pseudonym Timothy Titcomb. In this volume he argued that Providence "… does not release us from effort, in every legitimate and needful way, for the accomplishment of our laudable purposes; but when our efforts are complete, it takes care of the rest … having done what (a person) can, the remainder is in His hands" (Titcomb, 1862, pp. 287-288). Hopefully, this intellectual history, coupled with the research that has been presented here, will serve to rekindle interest in this core facet of religion.

Acknowledgments

This research was supported by the following grants from the National Institute on Aging: RO1 AG014749, RO1 AG026259, and a grant from the John Templeton Foundation through the Duke University Center for Spirituality, Theology, and Health.

References

Alwin, DF. Structural equation models in research on human development and aging. In: Schaie, KW.; Campbell, RT.; Meredith, W.; Rawlings, SC., editors. Methodological issues in aging research. New York: Springer; 1988. p. 71-170.

Aspinwall, LG. What I don't know won't hurt me: Optimism, attention to negative information, coping, and health. In: Gillham, JE., editor. The science of optimism and hope: Research essays in honor of Martin E. P. Seligman. West Conshohocken, PA: Templeton Foundation Press; 2000. p. 163-200.

Barna, G. The state of the church 2002. Ventura, CA: Issachar Resources; 2002.

Battista J, Almond R. The development of meaning in life. Psychiatry 1973;36:409–427. [PubMed: 4756415]

Berrenberg JL. The Belief in Personal Control Scale: A measure of God-mediated and exaggerated control. Journal of Personality Assessment 1987;51:194–206. [PubMed: 16372847]

Bollen, KA. Structural equations with latent variables. New York: Wiley; 1989.

Bower JE, Kemeny ME, Taylor SE, Fahey JL. Finding positive meaning and its association with natural killer cell cytotoxicity among participants in a bereavement-related disclosure intervention. Annals of Behavioral Medicine 2003;25:146–155. [PubMed: 12704017]

Bradley, WJ.; Schaefer, KC. The uses and misuses of data and models: The mathematization of the human sciences. Thousand Oaks, CA: Sage; 1998.

Centers for Disease Control and Prevention. Health in the United States, 2008: Special excerpt: Trend tables on 65 and older population. Washington, DC: U.S. Government Printing Office; 2008.

Cicutto L, Brooks D, Henderson K. Self-care issues from the perspective of individuals with chronic obstructive pulmonary disease. Patient Education and Counseling 2004;55:168–176. [PubMed: 15530751]

Cohen S, Rodriguez MS. Pathways linking affective disturbances and physical disorders. Health Psychology 1995;14:374–380. [PubMed: 7498107]

DeShon RP. A cautionary note on measurement error correlations in structural equation models. Psychological Methods 1998;3:412–423.

du Toit, M.; du Toit, S. Interactive LISREL: User's guide. Lincolnwood, IL: Scientific Software International; 2001.

Enders CK. A primer on maximum likelihood algorithms available for use with missing data. Structural Equation Modeling 2001;8:128–141.

Fetzer Institute/National Institute on Aging Working Group. Multidimensional measurement of religiousness/spirituality for use in health research. Kalamazoo, MI: John E. Fetzer Institute; 1999.

Giltay EJ, Geleijnse JM, Zitman FG, Buijsse B, Kromhout D. Lifestyle and dietary correlates of dispositional optimism in men: The Zutphen Elderly Study. Journal of Psychosomatic Research 2007;63:483–490. [PubMed: 17980220]

Goggin K, Melcarne VL, Murray TS, Metcalf KA, Wallston KA. Do religious and control cognitions predict risky behavior? II. Development and validation of the sexual risk behavior-related God locus of control scale. Cognitive Therapy and Research 2007;31:123–139.

Graham JW, Olchowski AE, Gilreath TD. How many imputations are really needed? Some practical clarifications of multiple imputation theory. Prevention Science 2007;8:206–213. [PubMed: 17549635]

Grant RW, Mariani RA, Vierira VJ, Fleshner M, et al. Cardiovascular exercise intervention improves the primary antibody response to keyhole limpet hemocyanin (KLH) in previously sedentary older adults. Brain, Behavior, and Immunity 2008;22:923–932.

Kelloway, EK. Using LISREL for structural equation modeling. Thousand Oaks, CA: Sage; 1998.

Kessler, RC.; Greenberg, D. Linear panel analysis: Models of quantitative change. New York: Academic Press; 1981.

Kline, RB. Principles and practice of structural equation modeling. New York: Guilford; 2005.

Koenig, HG.; McCullough, ME.; Larson, DB. Handbook of religion and health. New York: Oxford University Press; 2001.

Krause N. A comprehensive strategy for developing closed-ended survey items for use in studies of older adults. Journal of Gerontology: Social Sciences 2002;57B:S263–S274.

Krause, N. The social foundations of personal control in late life. In: Zarit, SH.; Pearlin, LI.; Schaie, KW., editors. Personal control in social and life course contexts. New York: Springer; 2003. p. 45-70.

Krause N. Stressors in highly valued roles, meaning in life, and the physical health status of older adults. Journal of Gerontology: Social Sciences 2004;59B:S287–S297.

Krause N. God-mediated control and psychological well-being in late life. Research on Aging 2005;27:136–164.

Krause N. Social involvement in religious institutions and God-mediated control beliefs: A longitudinal investigation. Journal for the Scientific Study of Religion 2007a;46:519–537.

Krause N. Evaluating the stress-buffering function of meaning in life among older people. Journal of Aging and Health 2007b;19:792–812. [PubMed: 17827448]

Krause, N. Aging in the Church: How social relationships affect health. West Conshohocken PA: Templeton Foundation Press; 2008.

Lee G. Kinship and social support of the elderly: The case of the United States. Ageing and Society 1985;5:19–38.

Marmot, M.; Wilkinson, RG. Social determinants of health. New York: Oxford University Press; 1999.

McCullough, ME.; Pargament, KI.; Thoresen, CE. Forgiveness: Theory, research, and practice. New York: Guilford; 2000.

Meredith, GE.; Schewe, CD. Defining markets, defining moments: America's 7 cohorts, their shared experiences, and why business should care. New York: Hungry Minds, Inc.; 2002.

Mirowsky J. Age and sense of control. Social Psychology Quarterly 1995;58:31–43.

Mirowsky, J.; Ross, CE. Education, social status, and health. New York: Aldine De Gruyter; 2003.

Murray TS, Goggin K, Melcarne VL. Development and validation of the alcohol-related God locus of control scale. Addictive Behaviors 2006;31:553–558. [PubMed: 16469452]

Pargament, KI. The psychology of religious coping: Theory, research, and practice. New York: Guilford; 1997.

Peterson C, Seligman ME, Vaillant GE. Pessimistic explanatory style is a risk factor for physical illness: A thirty-five year longitudinal study. Journal of Personality and Social Psychology 1988;55:23–27. [PubMed: 3418489]

Reker GT. Personal meaning, optimism, and choice: Existential predictors of depression in community and institutional elderly. The Gerontologist 1997;37:709–716. [PubMed: 9432987]

Reker, GT. Theoretical perspective, dimensions, and measurement of existential meaning. In: Reker, GT.; Chamberlain, K., editors. Exploring existential meaning: Optimizing human development across the life span. Thousand Oaks, CA: Sage; 2000. p. 39-55.

Salovey P, Rothman AJ, Detweiler JB, Steward WT. Emotion states and physical health. American Psychologist 2000;55:110–121. [PubMed: 11392855]

Scheier MF, Carver CS. Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. Health Psychology 1985;4:219–247. [PubMed: 4029106]

Schieman S, Pudrovska T, Milkie MA. The sense of divine control and the self-concept. Review of Religious Research 2005;27:165–196.

Schieman S, Pudrovska T, Pearlin LI, Ellison CG. The sense of divine control and psychological distress: Variations across race and socioeconomic status. Journal for the Scientific Study of Religion 2006;45:529–549.

Schmitt NW, Colligan MJ. Lack of stress-health relationships: A base rate problem? Journal of Community Psychology 1984;12:245–252. [PubMed: 10267401]

Smith, H. The meaning of life in the world's religions. In: Runzo, J.; Martin, NM., editors. The meaning of life in the world religions. New York: Oneworld Publications; 2000. p. 255-266.

Stark, R. What Americans really believe. Waco, TX: Baylor University Press; 2008.

Stark, R.; Finke, R. Acts of faith: Explaining the human side of religion. Berkeley, CA: University of California Press; 2000.

Steger MF, Mann JR, Michels P, Cooper TC. Meaning in life, anxiety, depression, and general health among smoking cessation patients. Journal of Psychosomatic Research 2009;67:353–358. [PubMed: 19773029]

Thege BK, Bachner YG, Kushnir T, Kopp MS. Relationship between meaning in life and smoking status. Addictive Behaviors 2009;34:117–120. [PubMed: 18842347]

Titcomb, T. Lessons in life: A series of familiar essays. New York: Charles Scribner; 1862.

Wallston KA, Melcarne VL, Flores L, Hansdottir I, Smith GA, Stein MJ, Weisman MH, Clements PJ. Does God determine your health? The God locus of health control scale. Cognitive Therapy and Research 1999;23:131–142.

Ward, K. Religion and the question of meaning. In: Runzo, J.; Martin, NM., editors. The meaning of life in the world religions. New York: Oneworld Publications; 2000. p. 11-30.

Welton GL, Adkins AG, Ingle SL, Dixon WA. God control: The fourth dimension. Journal of Psychology and Theology 1996;24:13–25.

Wong, PT.; Fry, PS. The human search for meaning: A handbook of psychological research and clinical applications. Mahwah, NJ: Lawrence Erlbaum; 1998.

Wuthnow, R. Studying religion and making it sociological. In: Dillon, M., editor. Handbook of the sociology of religion. New York: Cambridge University Press; 2003. p. 16-30.

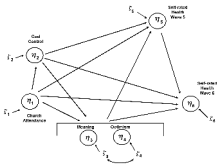

Figure 1.
A Conceptual Model of God-Mediated Control and Change In Self-Rated Health

Table 1

Core Study Measures

1. Church Attendance (Wave 5)[a]
   How often do you attend religious services?
2. God-Mediated Control (Wave 5)[b]
   - **A.** I rely on God to help me control my life.
   - **B.** I can succeed with God's help
   - **C.** All things are possible when I work together with God.
3. Meaning in Life (Wave 5)[b]
   - **A.** Values
     - **a.** I have a system of values and beliefs that guide my daily activities.
     - **b.** I have a philosophy of life that helps me understand who I am.
   - **B.** Purpose
     - **a.** I feel like I am living fully.
     - **b.** I feel I have found a really significant meaning in my life.
   - **C.** Goals
     - **a.** In my life, I have clear goals and aims.
     - **b.** I have a sense of direction and purpose in life.
   - **D.** Reconciling the Past
     - **a.** I feel good when I think of what I have done in the past.
     - **b.** I am at peace with my past.
4. Optimism[b]
   - **A.** I always look on the bright side of things.
   - **B.** In uncertain times I always expect the best.
   - **C.** I feel confident the rest of my life will turn out well.
5. Self-Rated Health (Wave 5 and Wave 6)
   - **A.** How would you rate your overall health at the present time?[c]
   - **B.** In general, how satisfied are you with your health?[d]
   - **C.** Would you say your health is better, about the same, or worse than most people your age?[e]

[a] This item is scored in the following manner (coding in parentheses): never (1), less than once a year (2), about once or twice a year (3), several times a year (4) about once a month (5), 2-3 times a month (6), nearly every week (7), every week (8), several times a week (9).

[b] These items are scored in the following manner: disagree strongly (1), disagree (2), agree (3), agree strongly (4).

[c] This item is scored in the following manner: poor (1), fair (2), good (3), excellent (4).

[d] This item is scored in the following manner: not at all satisfied (1), not very satisfied (2), somewhat satisfied (3), very satisfied (4), completely satisfied (5).

[e] This item is scored in the following manner: worse (1), about the same (2), better (3).

Table 2

Measurement Model Parameter Estimates for Core Study Measures (N = 1,011)

Construct	Factor Loading[a]	Measurement Error[b]
1. Church Attendance - Wave 5	1.000	0.000
2. God-Mediated Control - Wave 5		
A. Rely on God[c]	.916	.161
B. Succeed with God's help	.953	.091
C. All things are possible	.951	.095
3. Meaning in Life - Wave 5		
A. Values	.660	.565
B. Purpose	.855	.269
C. Goals	.825	.320
D. Past	.694	.518
4. Optimism - Wave 5		
A. Look on bright side	.755	.430
B. Always expect best	.848	.282
C. Feel confident	.834	.304
5. Self-Rated Health - Wave 5[d]		
A. Rate overall health	.893	.202
B. Satisfied with health	.833	.307
C. Compare health to others	.582	.662
6. Self-Rated Health - Wave 6		
A. Rate overall health	.905	.180
B. Satisfied with health	.850	.277
C. Compare health to others	.609	.629

[a] Factor loadings are from the completely standardized solution. The first-listed item for each latent construct was fixed at 1.0 in the unstandardized solution.

[b] Measurement error terms are from the completely standardized solution. All factor loadings and measurement error terms are significant at the .001 level.

[c] Item content is paraphrased for the purpose of identification. See Table 1 for the complete text of each indicator.

[d] The factor loadings and measurement error terms were constrained to be equivalent in the unstandardized solution for the identical Wave 5 and Wave 6 self-rated health measures.

Table 3

God-mediated Control and Change in Health (N = 1,011)

	Dependent Variables					
Independent Variables	**Church Attendance**	**God-mediated Control**	**Meaning In Life**	**Optimism**	**Self-rated Hlth(Wave5)**	**Self-rated Hlth(Wave6)**
Age	-.087[a]	-.005	-.086*	.020	.019	-.022
	(-.033)[b]	(-.001)	(-.007)	(.001)	(.002)	(-.002)
Sex	-.139**	-.099**	.054	.062	.020	.027
	(-.854)	(-.148)	(.073)	(.069)	(.031)	(.044)
Education	.072*	-.103***	.124***	.079*	.178***	.081**
	(.063)	(-.022)	(.024)	(.013)	(.039)	(.019)
Marital status	.094*	-.025	.124***	.047	.035	-.014
	(.554)	(-.036)	(.162)	(.051)	(.051)	(-.021)
Church attendance		.520***	.195***	.114**	.131***	.019
		(.127)	(.043)	(.021)	(.032)	(.005)
God-mediated control			.279***	.347***	-.183***	-.079*
			(.252)	(.257)	(-.184)	(-.085)
Meaning in life					.174***	.062
					(.194)	(.074)
Optimism					.310***	.023
					(.421)	(.033)
Self-rated health (Wave 5)						.613***
						(.658)
Multiple R^2	.034	.295	.233	.178	.259	.463

[a] Standardized regression coefficient. These estimates reflect direct effects only.

[b] Metric (unstandardized) coefficient

* = $p < .05$;

** = $p < .01$;

*** = $p < .001$.

Table 4

Decomposition of Effects (N = 1,011)

Dependent Variable / Independent Variable	Direct Effect (A)	Indirect Effect (B)	Total Effect (A + B)
Church Attendance / Education	.072*[a]	……	.072*
God-mediated Control/ Education	-.103***	.037*	-.066*
Meaning in Life / Education	.124***	-.004	.120***
Optimism / Education	.079*	-.015	.064
Self-rated Health (Wave 5) / Education	.178***	.063***	.241***
Self-rated Health (Wave 6) / Education	.081**	.163***	.244***
God-mediated Control / Church Attendance	.520***	……	.520***
Meaning in Life / Church Attendance	.195***	.145***	.340***
Optimism / Church Attendance	.114**	.181***	.295***
Self-rated Health (Wave 5) / Church Attendance	.131***	.056*	.187***
Self-rated Health (Wave 6) / Church Attendance	.019	.102***	.121***
Meaning in Life / God mediated Control	.279***	……	.279***
Optimism / God-mediated Control	.347***	……	.347***
Self-rated Health (Wave 5) / God-mediated Control	-.183***	.156***	-.027
Self-rated Health (Wave 6) / God-mediated Control	-.079*	.009	-.070
Self-rated Health (Wave 5) / Meaning in Life	.174***	……	.174***
Self-rated Health (Wave 6) / Meaning in Life	.062	……	.062
Self-rated Health (Wave 5) / Optimism	.310***	……	.310***
Self-rated Health (Wave 6) / Optimism	.023	……	.023
Self-rated Health (Wave 5) / Self-rated Health (Wave 6)	.613***	……	.613***

[a] All coefficients in the table are standardized coefficients.

* = $p < .05$;

** = $p < .01$;

*** = $p < .001$.