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The God factor: the role of religious involvement on depression, health, and well-being

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**The God factor: The role of religious involvement on depression, health, and
well-being**

by

Arlene Maria de la Mora

A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

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In Loving Memory of My Dad

To say my father taught me the value of an education would be an underestimation of his influence in my life. I was three years old when my father moved our family from Mexico to Los Angeles so my brother, sister, and I could have educational opportunities not available to us in Mexico. Whenever we spoke of going college, it was never “if” but “when” you go to college. Unfortunately, my father was not able to share this major accomplishment, but I know that he would have been proud of me.

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CHAPTER 1. INTRODUCTION

“Even though I walk through the valley of the shadow of death, I will fear no evil, for you are with me; your rod and your staff, they comfort me.”

(Psalm 23:4)

Psalm 23:4 is quoted so frequently that many people, whether they are religious or not, have heard it. Religion plays a central role in the lives of Americans. In the United States, the majority of adults (95%) believe in God, 92% are affiliated with a church or synagogue, 90% pray (75% pray daily), 59% indicate that religion is “very important” in their lives, and 44% attend church on a weekly basis (Gallup, 2001). For many, belief in God or a Supreme Being provides inspiration, strength and comfort in good and bad times.

There is a good deal of evidence suggesting that religious involvement (e.g., going to church) plays a causal role in health and well-being, protecting us against illness and mortality. A meta-analysis of data involving 42 studies found that religious involvement was significantly associated with lower mortality after controlling for the influence of several possible confounding variables (McCullough, Hoyt, Larson, Koenig, & Thoresen, 2000). The observation that religious involvement may confer benefits on health and well-being is not a new one. In his writings, Durkheim suggested that there is a link between religion and suicide because religion represents a society with common beliefs and practices where preservation of life is of value, therefore “religion protects” against the taking of life (Durkheim, 1951, p. 170).

A considerable amount of research has evaluated religious involvement and its relation to mortality and other various indicators of health and well-being (e.g., cardiovascular disease, cancer, self-esteem). Attempts to identify the mechanism(s) by

which religious involvement confers its benefits upon mortality, health, and well-being have led to inconsistent findings among researchers. These inconsistencies are partly a result of conceptual and methodological problems associated with examining these relationships.

The present investigation was designed to explore the relationship between religious involvement, depression, health, and well-being, and to examine whether benefits derived from religious involvement differ between men and women. An overview of the conceptual and methodological problems associated with measuring religious involvement and its relation to health and well-being will be presented first. Evidence of an association between religion, health and well-being and mechanisms that may explain these associations will then be summarized.

CHAPTER 2. LITERATURE REVIEW

Defining Religion/Spirituality

Defining religion and spirituality is difficult. It means different things to different people. Reaching a consensus in defining religion and spirituality is one of the greatest challenges faced by researchers interested in these constructs (Jarvis & Northcott, 1987). Although some researchers view religion and spirituality as different concepts, the majority of Americans use these terms interchangeably (Zinnbauer, Pargament, Cowell, Rye, & Scott, 1997, cited in George, Larson, Koenig, & McCullough, 2000, p.103). Yet others describe themselves as being spiritual but not religious. Although religion may be viewed as an organized system of beliefs and practice (Jenkins & Pargament, 1995), it is usually associated with a formal religious institution or collective organization (Pargament, 1997). By contrast, spirituality is not linked to any religious institution or organization. The National Institute for Healthcare Research has defined spirituality as “the feelings, thoughts, experiences, and behaviors that arise from a search for the sacred” (Larson, Swyers, & McCullough, 1997; cited in George et al., 2000, p.104).

Spirituality and religion may be viewed as separate multidimensional constructs. Dimensions of spirituality and religion that have been identified include preference and affiliation (i.e., membership in a particular religious/spiritual organization or group), public (e.g., church attendance, participation in church activities) and private (e.g., reading scripture, prayer) practices, religious/spiritual support, religious/spiritual coping, beliefs and values, commitment (i.e., importance), and history of involvement (George et al., 2000; Hoge, 1996).

Assessment of Religion/Spirituality

Currently, research on religious involvement and health suffers from conceptual and methodological problems, making it difficult to ascertain the true association between religious involvement and health. In particular, there is currently no consistent method of assessing religiosity or spirituality. Rather than examining religion along multiple dimensions (e.g., attitudes, beliefs, commitment, practice and behavior, cognition), researchers generally tend to focus on only one aspect of religion (e.g., prayer, religious orientation, spiritual well-being, religion as a coping strategy). Researchers may choose to examine these dimensions of religion and spirituality separately in part because there is also no consensus among researchers about the number or identity of the dimensions that comprise religion (George et al., 2000). At least 126 different measures of religious and/or spiritual involvement have been identified in a book of religious measures (Hill & Hood, 1999). A problem suggested by Hill and Hood (1999) is that researchers continue to develop measures of religiosity rather than utilizing reliable and valid measures that are already available.

Many researchers measure the frequency of church attendance as a proxy variable for religious involvement (e.g., beliefs, commitment). The problem with this method of assessment is that frequency of church attendance may only reflect behavior associated with religious involvement and may not necessarily reflect attitudes, beliefs, or commitment. Understanding the role of religious involvement and preferences on health and well-being is also made more difficult because people have many different reasons for why they are or are not religious. For example, people may attend church for many different reasons (i.e., faith,

beliefs, political correctness, obligations to family, social network); therefore, measuring church attendance may not accurately capture the construct of religiosity or spirituality.

Another issue confronting researchers examining religious involvement is the role of religious affiliation/preference. When asked to indicate their religious preferences in a 1998 Gallup Poll, a majority of Americans indicated Protestant (59%); 27% indicated Roman Catholic, 1% Orthodox, 1% Mormon, 1% Jewish, and 6% indicated no preference (Gallup Jr. & Lindsay, 1999). Although these religions share some similarities (e.g., the belief in a supreme being or God), they also possess many significant differences. The Protestant religion, for example, is comprised of various subgroups (e.g., Lutheran, Baptist, Methodist, Presbyterian), each with their own set of beliefs and practices.

Religious preferences and affiliation may be associated with health and well-being, yet they are often ignored by researchers. For example, religious involvement is often operationalized by measuring frequency of church attendance regardless of religious affiliation. This approach, however, may represent an invalid assessment strategy for some religions. The measurement of frequency of church attendance is most appropriate for Christian religions (Packer, 1997). Orthodox Jewish law, for example, rarely requires the presence of women at synagogue services. Religious commitment and obligation may be fulfilled at home through prayer, observation of Jewish rituals (i.e., Sabbath, Passover), and raising children in the Jewish faith (Packer, 1997).

Another way in which religious preferences/affiliation may contribute to the effects of religious involvement (e.g., church attendance) on health is that some religions (e.g., Church of Jesus Christ of Latter-day Saints) may promote good health by prohibiting

smoking, the use of alcohol, caffeine, and drugs (see discussion below of Health practices prescribed by religious doctrine).

A related methodological problem involves the use of a single item (e.g., How often do you attend church?) as a measure of religious involvement. In a meta-analysis examining the relationship between religious involvement and mortality, slightly more than half (55%) of the 42 effect sizes used in the analysis were based on single-item measures of religious attendance (McCullough et al., 2000). Use of a single item measure decreases reliability thereby attenuating the association between religious involvement and measures of health and well-being (Hill & Hood, 1999).

Many studies have reported a positive association between religious involvement and health and well-being. The majority of these studies employ designs relying on correlational analyses of data in their examination of religious involvement and health. When using correlational study designs, researchers are interested in determining whether levels of religious involvement corresponds to levels of health and well-being. Correlational analysis may be a satisfactory preliminary method of analysis, but it does have several prominent disadvantages in this type of research. One disadvantage in relying on correlational designs is that the direction of causality is difficult to ascertain. For example, correlational analyses may suggest that people who attend church more frequently have higher levels of self-esteem. It is possible, however, that greater levels of self-esteem lead to more frequent church attendance. Correlational or cross-sectional design studies often fail to include individuals who stop attending church due to poor health. Therefore, these correlational or cross-sectional studies may find that the health status of people who do attend church tends

to be better than people who attend less often, not because of their religious involvement but because people with poor health have stopped attending church.

Another disadvantage is that this type of analysis fails to control for the possible influence of other variables (e.g., social support, physical health) on the relationship between religious involvement and health. For example, perceived social support has been found to be positively related to health and well-being (Russell & Cutrona, 1991; Bowling, 1994). A possible effect of church affiliation and attendance may be to increase the size of an individual's social network. Therefore, church attendance may have an indirect influence on health and well-being through its effect on a person's social network. To examine the relationships among the various religious and health constructs, more advanced data analysis techniques (e.g., regression analysis, structural equation modeling) must be utilized.

Some of these methodological problems may be remedied by using a longitudinal design in examining the relationship between religious involvement and health and well-being over time. By following individuals over a period of time we can see whether religious involvement predicts changes in health and well-being. For example, if individuals who did not attend church on a regular basis later develop health problems at a higher rate than individuals who attended church on a regular basis, then we can be more confident in concluding that attending church confers some protection against illness and disease.

Moderators and Demographic Controls of the Relationship between Religious Involvement, Health and Well-Being

Other variables may moderate the effects of religious involvement and health and well-being. The role of demographic variables and its role in the relationship in health status and religious affiliation will be discussed as possible mediators of this association.

Demographic Characteristics (Gender, Ethnicity, Age, Education)

Demographic characteristics that may influence the effects of religion on health and well-being include gender, ethnicity, age, education, health status, and religious preferences/affiliation will be described below.

The protective benefits derived from religious beliefs and/or involvement may vary as a function of gender. Some studies suggest that the effects of religious involvement on health and well-being are stronger for women. Women with greater religious involvement (e.g., more frequent church attendance) are less likely to die prematurely than men with comparable levels of involvement (Bryant & Rakowski, 1992; Clark, Friedman, & Martin, 1999; McCullough et al., 2000; Strawbridge, Cohen, Shema, & Kaplan, 1997). The finding that the relationship is stronger for women than men is consistent with other research examining the relationship between health and well-being and interpersonal relationships (e.g., loneliness, social support, and social networks; Berkman, Vaccarino, & Seeman, 1993).

Some research also suggests that religious involvement may differ as a function of race or ethnicity (Blaine & Crocker, 1995). The importance of religious involvement may be greater among African-American individuals. A Gallup Poll conducted in 1998 found that 85% of African-Americans thought religion was very important in their lives compared to 75% of Hispanics and 58% of Whites (Gallup Jr. & Lindsay, 1999). Ethnic and racial differences have been found in the frequency of church attendance. For example, 55% of African-Americans attend church on a weekly basis compared with 48% of Hispanics and 39% of Whites (Gallup Jr. & Lindsay, 1999).

Religious involvement may also be more important to older individuals than to younger individuals. That is, as individuals get older religion may become more important,

especially as their health begins to decline (Koenig, 1993). Religion may also be more salient to older individuals because they grew up during a time when religion was viewed as being more important (Koenig, 1993). If religion is more important to older individuals then we should expect to find a stronger association between religious involvement and health and well-being among the aged.

Education is a demographic characteristic that is often associated with health and well-being. Individuals with higher levels of education are at lower risk of premature death (Pappas, Queen, Hadden, & Fisher, 1993), typically enjoy better health (Adler et al., 1994), are exposed to fewer stressful life events (Dohrenwend, 1973), and among white individuals are more likely to utilize health care services (Mutchler & Burr, 1991). Religious involvement appears to be highest among individuals who are less educated (Argyle, 1994). Elderly adults with less education are more likely to utilize religious coping strategies than those who are more educated (Krause, 1995). Individuals who are less educated are also more likely to use their religious beliefs and faith in making sense of the world around them (Ellison, 1991) and more likely to believe in God's power to heal (i.e., via physicians; Mansfield, Mitchell, & King, 2002) than individuals with higher levels of education. Researchers therefore need to control for the effects of level of education in examining the role of religious involvement in promoting health and well-being in order to determine the effects of religious involvement net of the effects of education on health and well-being.

Health Status (Physical and Psychological)

Religious involvement is positively associated with health and well-being (e.g., people who attend church live longer, cope better with illness). This relationship, however,

may become weaker when researchers control for the effects of prior and current physical and mental health status (Braam, Beekman, van Tilburg, Deeg, & van Tilburg, 1997; Helm, Hays, Flint, Koenig, & Blazer, 2000; Koenig, Pargament, & Nielsen, 1998; Palinkas, Wingard, & Barrett Connor, 1990). However, McCullough et al. (2000) found no evidence to suggest that controlling for the effects of physical health resulted in a weaker correlation between religious involvement and mortality.

Whether prior or current health status affects the relationship between religious involvement and health and well-being presents a challenge for researchers because the relationship depends upon the model being tested. The effects may differ depending on whether the researcher is interested in how individuals faced with a serious or terminal disease cope with their illness versus whether individuals who attend church more often live longer. For example, individuals who were not previously religious may seek the guidance, solace, and comfort provided by religious involvement in dealing with the onset of deteriorating health (Koenig, 1993). Researchers also may not find the benefits associated with long-term religious involvement (e.g., longer life) among individuals with a short exposure to religion. Nonetheless, many of these individuals could benefit in the short-term (e.g., acceptance, comfort) from church attendance.

Religious Affiliation

Religious affiliation may also influence depression, health, and well-being. For example, religious involvement is negatively related with the use of drugs and alcohol (see section on Good Health Practices Prescribed by Religious Doctrine). One possible explanation for the incidence of drug and alcohol use among people high in religious involvement may be adherence to strict proscriptions against their use by some Christian

groups (e.g., Latter-Day Saints, Seventh-Day Adventists, Amish, Hutterites; McCullough, Larson, Koenig, & Lerner, 1999). However, it should be noted that the incidence of drug and alcohol use tends to be low among people who belong to religious groups/organizations that do not prohibit their use. Individuals diagnosed with life threatening diseases (e.g., cancer, HIV/AIDS, cardiovascular disease) often indicate that religious coping is helpful in providing comfort to them. However, whether religious coping serves to alleviate the stress associated with these life-threatening diseases may depend upon the individual's religious affiliation. A longitudinal study examining religious coping among Hispanic women diagnosed with early-stage breast cancer found that the effects of religiosity on distress were different for Catholic versus Evangelical women (Alferi, 1999). Among Catholic women, greater church attendance at 6 months predicted *higher* levels of distress at 12 months. By contrast, among Evangelical women emotional support from church members at 6 months predicted *lower* levels of distress at 12 months.

Rates of depression may also differ as a function of religious affiliation. Religious preference has been found to be associated with higher levels of depression (Kennedy, Kelman, Thomas, & Chen, 1996; Miller, Warner, Wickramaratne, & Weissman, 1997). Older Jewish adults were twice as likely to report depressive symptoms than older Catholic adults (Kennedy et al., 1996). A longitudinal study of depressed mothers and their offspring also found that mothers who were Catholic were 79% less likely to be diagnosed with a major depressive disorder (MDD) than mothers who were Protestant net of depression at time 1 (Miller et al., 1997). Elderly Protestant Dutch individuals were also more likely to have higher scores on measures of depression than Catholic, Dutch Reform, or Calvinist individuals (Arjan W. Braam et al., 1998). A longitudinal study of participants living in

North Carolina found that individuals who indicated they were Pentecostal had a three times greater risk of major depression than individuals with other or no religious affiliation (Meador, Koenig, Hughes, Blazer et al., 1992).

Evidence of an Association Between Religiosity and Health and Well-Being

Numerous studies suggest that religious involvement has a positive effect on various indicators of health and well-being: mortality, cardiovascular disease, cancer, depression, loneliness, life satisfaction and happiness, and self-esteem. Jarvis and Northcott (1987) suggest that religion confers its effects on health risks (e.g., mortality) through religious participation, health-related attitudes and behaviors (as pre/proscribed by the religion), and social support provided by the religious group. The following is a summary of findings suggesting an association between religion and health and well-being. Outcomes include (a) mortality, (b) cardiovascular disease, (c) depression and mental health problems, (d) loneliness, (e) life satisfaction and happiness, (f) aggression and hostility, and (g) self-esteem.

Mortality

There are a number of studies that demonstrate the protective advantages of religious involvement and beliefs against mortality. In particular, the role religious involvement plays in overall mortality and in protecting against various medical conditions such as cancer, cardiovascular disease, and HIV/AIDS has been examined.

Longitudinal studies examining predictors of mortality have found that religious involvement is associated with a longer life. A review of the 1987 National Health Interview Survey (NHIS) Multiple Cause of Death data set that followed participants over eight years (i.e., 1987-1995) indicated that religious attendance was related to overall mortality

(Hummer, Rogers, Nam, & Ellison, 1999). Individuals who never attended church were 1.87 times more likely to die a premature death than individuals who attended church on a weekly basis. The risk of death among people who don't attend church remains significant even when controlling for health status, socioeconomic status, and social ties (Hummer et al., 1999). Elderly individuals living in Marin County, California, who attended religious services on a weekly basis had lower mortality rates than individuals who attended church less frequently, whereas those individuals who did not attend any religious services had the highest rates of mortality (Oman & Reed, 1998). Similarly, elderly African-American individuals who did not attend church were 1.77 times more likely to die than those who attended church on a regular basis (Bryant & Rakowski, 1992). In addition, church attendance directly predicted mortality even after controlling for other variables (e.g., social support, loneliness, physical health, cognitive status, and mental health).

A two-year longitudinal study of low income elderly individuals forced to relocate found that religious involvement (e.g., attending church, extent of religiousness, religion as a source of comfort) interacted with health status in predicting mortality. That is, greater religious involvement was protective for this elderly cohort only if their health was poor (Zuckerman, Kasl, & Ostfeld, 1984).

Engaging in private religious activities (e.g., prayer, meditation, bible study) was also found to be protective against mortality. Individuals who rarely or never prayed, read the bible, or meditated were at greater risk of dying than those individuals who frequently engaged in these activities (Helm et al., 2000). Among the overall sample, the increased risk of death was no longer significant after demographic variables and physical/mental health variables were added to the model. However, when the participants were divided into either

an impaired or unimpaired activities of daily living (ADL) group, engaging in private religious activities was advantageous only to the impaired ADL group. Religious involvement was not beneficial for the unimpaired group net of demographic, physical, and mental health variables (Helm et al., 2000).

In examining the cause of death (i.e., suicide versus natural cause of death) among adults aged 50 and older, researchers found that the incidence of suicide was the greatest among individuals who never attended church or who attended church less than one time per month (Nisbet, Duberstein, Conwell, & Seidlitz, 2000).

Although religious involvement appears to be beneficial for individuals who attend religious services on a frequent basis, the benefit appears to be greatest for women (Strawbridge et al., 1997). A longitudinal study examining the relation between religiosity and mortality found that women who attended church one or more times per week were less likely to die a premature death than men (Clark et al., 1999). The risk of premature death was even greater among elderly African-American men; men who did not attend church had a 2.7 times greater risk of premature death than women who did attend church (Bryant & Rakowski, 1992).

Cardiovascular Disease

In the United States, the leading cause of death for both men and women is cardiovascular disease (American Heart Association, 2000). Researchers have found that religious involvement has a positive effect on individuals diagnosed with some form of cardiovascular disease. For example, individuals who frequently attend religious services have been found to have lower blood pressure than those individuals who attend religious services on a less frequent basis (Koenig, George, Hays et al., 1998; Walsh, 1998).

Similarly, individuals who attend church and pray frequently had a 40% lower risk of having a diastolic blood pressure of 90mm Hg or higher than infrequent church attendees (Koenig, George, Hays et al., 1998).

Cardiac surgery patients who indicated that religious involvement/beliefs did not provide comfort or strength were three times more likely to die following their surgery than patients who indicated they received some comfort or strength from religious involvement (Oxman, Freeman, & Manheimer, 1995). Attending church was also related to risk of death among these patients. Cardiac surgery patients who attended church more frequently had a lower risk of dying after their surgery than patients who were infrequent attendees (Oxman et al., 1995).

Religious involvement (e.g., frequency of church attendance, comfort received from religion) was not related to the number of limitations in physical functioning or increased risk of rehospitalization among elderly stroke patients six weeks after discharge (Colantonio, Kasl, Ostfeld, & Berkman, 1993). However, size of the sample employed in this study (87 participants) may have limited the researchers ability to detect a relationship (Colantonio et al., 1993).

Good Physical Health as a Consequence of Religious Involvement

The positive and beneficial effects of religious involvement on physical health are not as well documented as the effects of religious involvement on mental health. Many researchers have found religious involvement to provide protective benefits against cancer (i.e., greater survival rates; Ell, 1989), in cardiovascular disease (i.e., lower incidence of cardiovascular disease; Koenig, George, Hays et al., 1998; Walsh, 1998), and on self-reported health (i.e., higher levels of health; Krause, Ingersoll Dayton, Liang, & Sugisawa,

1999). Church attendance may also confer salutary effects among older medically ill individuals. Frequent church attendance was related to better overall health, reduced medical diagnosis, lower severity of illness, and less impairment of the activities of daily life among an elderly general medical inpatient sample (Koenig, Pargament et al., 1998). Elderly individuals who attended church on a regular basis were less likely to have medical illness burden (as measured by severity of organ impairment; Koenig, 1998), to also visit their physicians more often, and to have fewer hospital visits (Nelson, 1993). The relationship between attending church, physician visits, and hospitalization remained significant after controlling for the effects of social support in a large community sample (Nelson, 1993). For both men and women, attending religious services more often is associated with lower functional disabilities (Idler, 1987). The relationship between attending church and functional disabilities remains significant net of health status and demographic variables (Idler, 1987). Interestingly, impairment of physical functioning was not found to deter elderly individuals from attending church on a regular basis among an elderly inpatient sample (Koenig, 1998). Elderly Mexican-Americans who attend church more frequently also rated their health higher than individuals who attend church less frequently (Levin & Markides, 1985). Among Mexican-Americans under the age of 74, frequency of church attendance was unrelated to ratings of perceived health (Levin & Markides, 1985).

Private religious practices (e.g., prayer, reading scripture) are modestly related to self-reported ratings of physical health. Among an elderly Japanese sample, individuals who prayed and made offerings to ancestors, read scripture, and listened to or viewed religious programming were more likely to report high levels of physical health (Krause et al., 1999).

Membership in a religious organization is related to perceived health and the use of health services (e.g., physician visits, walk-in clinic visits, emergency room visits, and dental visits; Frankel & Hewitt, 1994). A retrospective study indicated that students who were affiliated with one of the various Christian faith groups on campus were more likely to perceive themselves as healthy and less likely to have used health care services during the previous six months than students who were not affiliated (Frankel & Hewitt, 1994). However, the use of health care services (e.g., frequency of visits to a physician) was inversely related to religious involvement as a function of age among three generations of Mexican-American individuals (younger, middle, older; Levin & Markides, 1985). Among the younger cohort, individuals high in religious involvement were more likely to seek health care services during the previous year. Among the middle and older cohorts, level of religious involvement was not related to frequency of seeking health care services.

Depression and Mental Health

A number of researchers have found associations between religious involvement and depression and mental health. Church attendance is associated with lower levels of depression (Hovey, 2000; Idler, 1987; Koenig, 1998; Lee, DeMaris, Bavin, & Sullivan, 2001; Sherkat & Reed, 1992; Thearle, Vance, Najman, Embelton, et al., 1995). The relationship between church attendance and depression remains significant after controlling for the influence of sociodemographic variables, physical impairment, and social support (A. W. Braam et al., 1997; Koenig, Pargament et al., 1998; Palinkas et al., 1990). Men who attend religious services on a weekly basis are also less likely to be depressed than those who do not (Oman & Reed, 1998). However, in a similar study that controlled for the influence of

participants' health status, the relationship between attending church and health status was not significant (Idler, 1987).

High levels of organizational religious involvement (e.g., frequency of church attendance and taking part in church-related activities) is inversely associated with depression in some studies (Strawbridge, Shema, Cohen, Roberts, & Kaplan, 1998; Idler & Kasl, 1992). Measures of spirituality (e.g., meaning of life and self-transcendence) are negatively related to depression (Klaas, 1998; Young, Cashwell, & Shcherbakova, 2000), and personal prayer is also predictive of lower depressive symptoms among males and females (Maltby, Lewis, & Day, 1999). However, other researchers have not found high levels of personal religious involvement (e.g., frequency of prayer, importance of religion) to be related to depression (Strawbridge et al., 1998).

Intrinsic and extrinsic religious orientation have been found to be differently associated with depression. Intrinsic religious orientation reflects the extent to which individuals "live" their religion. That is, individuals who are high in intrinsic religious orientation are motivated by the traditions and teachings of their religion (Allport & Ross, 1967). By contrast, an extrinsic religious orientation reflects the extent to which individuals endorse religious beliefs and attitudes or engage in behaviors in order to gain some form of social advantage or social approval. Individuals who are high in extrinsic religious orientation are motivated by the social benefits that may be derived as a result of their religious involvement.

Men and women with an intrinsic religious orientation are less likely to be depressed (Nelson, 1989a, b; 1990; Watson, Morris, & Hood, 1989a, b; 1988a, b), whereas men and women with an extrinsic religious orientation are more likely to be depressed (Genia, 1998;

Maltby & Day, 2000; Park, Murgatroyd, Raynock, & Spillett, 1998; Watson et al., 1988a, b; 1989). Members of liberal Protestant churches with an intrinsic religious orientation (i.e., a personal relationship with God) are less likely to suffer from depression than individuals who do not have an intrinsic religious orientation (Hettler & Cohen, 1998). However, this relationship was not found for members of conservative Protestant churches with an intrinsic religious orientation. For individuals who are clinically depressed, intrinsic religious orientation is an important predictor of remission of depression (i.e., at least 2 or more weeks with fewer than 3 of 9 DSM-III criteria for depression; Koenig, George, & Peterson, 1998). Among older individuals with an intrinsic religious orientation, time between the onset of symptoms of depression and the reduction or cessation of symptoms is less than for individuals with an extrinsic religious orientation (Koenig, George, & Peterson, 1998).

College students and adolescents also benefit from religious involvement. Students who indicate they are high in spiritual well-being (i.e., they have a personal relationship with God and a purpose in life) were less likely to be depressed (Fehring, Brennan, & Keller, 1987; Jensen, Jensen, & Wiederhold, 1993; Koteskey, Little, & Matthews, 1991). A ten-year follow-up study of depressed mothers and their offspring found that mothers who indicated religion was very important to them were 81% less likely to have a major depressive disorder than mothers who indicated religion was not important in their lives (Miller et al., 1997).

The protective effects of religious involvement are also apparent among older individuals (A. W. Braam et al., 1997). Older individuals who were high in religious salience (e.g., intrinsic religious orientation) and reported having one or more chronic diseases, pain associated with physical health, and functional limitations were less likely to report being depressed (Arjan W. Braam, Beekman, Deeg, Smit, & van Tilburg, 1997).

Among nursing home residents, those who attended religious activities more often were less depressed than residents who attended religious activities less often (Commerford & Reznikoff, 1996; C. G. Ellison, 1995). However, whereas church attendance was related to lower levels of depression, intrinsic religiosity was not (Commerford & Reznikoff, 1996).

Ethnic differences have also been reported in the relation between religious involvement and depression. Attendance at church services was related to lower levels of depression among elderly African-Americans diagnosed with cancer but not among white elderly adults diagnosed with cancer (Musick, Koenig, Hays, & Cohen, 1998). Ethnic differences relative to depression may be a function of gender. For example, whereas religious involvement may have a protective or beneficial effect against depression for African-American women (Bryant & Rakowski, 1992), it is not always the case with African-American men. Among African-American men, level of religious involvement (e.g., low, medium, high) was not significantly related to depression (Gary, 1985).

Some researchers have found a non-linear relationship between religious involvement and depression. For example, urban African-Americans who were highly involved in religion and experienced chronic levels of economic strain were more likely to report depression than those with lower religious involvement (D. R. Brown, Gary, Greene, & Milburn, 1992). This suggests that the effects of religious involvement on depression may be non-linear. A longitudinal study involving a large sample of nationally representative individuals also found a curvilinear effect of religious salience (i.e., the importance of religious beliefs) on depression after controlling for the effects of social support and functional health status. This study indicated that individuals who were the least likely and most likely to believe that religious beliefs were very important were more likely to have

high scores on measures of depression than individuals who believed that religious beliefs were moderately important (Schnittker, 2001). A meta-analysis examining whether linear, curvilinear, and stress-buffering effects of religious involvement on depression suggested that studies that included nonlinear terms (e.g., cubic or quadratic terms) were more likely to find significant associations between depression and religious involvement (Schnittker, 2001).

Loneliness

Religious involvement has been associated with decreased feelings of loneliness (Le Roux, 1998). The desire to have close interpersonal relationships coupled with an inability to attain them may lead to the aversive state of loneliness. Attending church or participation in various religious activities may provide opportunities for social contact and connection with others, possibly reducing feelings of loneliness. Elderly adults with higher involvement in social aspects of religious activities (e.g., going to church, visiting friends from church) have been found to be less lonely than those with lower involvement (Johnson & Mullins, 1989). In this study, elderly adults with higher scores on a measure of spiritual well-being (i.e., those who endorsed the role of religious and existential beliefs in perceptions of well-being) were also less likely to indicate they were lonely. In a separate study, individuals who believed that God is helpful (rather than angry or vengeful) were also less likely to feel lonely (Schwab & Petersen, 1990).

In a study examining the relationship between church attendance, loneliness, and mortality in a sample of rural elderly, researchers found that individuals who were lonely were at higher risk for premature death (Russell, Cutrona, Hessling, & Wallace, 1998). Frequency of church attendance was found to be inversely related to loneliness. That is,

individuals who attended church on a frequent basis were less likely to be lonely than individuals who did not attend or infrequently attended church.

Sex differences in the relationship between religious involvement and loneliness have also been reported. The effects of religious involvement in reducing loneliness may be stronger for women than men (Kirkpatrick, Shillito, & Kellas, 1999). Having a personal relationship with God also appears to reduce the level of loneliness among women. By contrast, having a personal relationship with God is either unrelated to or positively related to loneliness for men (Kirkpatrick et al., 1999).

Life Satisfaction and Happiness

Life satisfaction, reflecting an individual's perception of his or her well-being and quality of life, is positively related to religious involvement. Individuals who are more religious (e.g., attend church frequently, report greater strength of religious beliefs) are more satisfied with their lives (Hong & Giannakopoulos, 1994; Martin Combs & Bayne Smith, 2000; Neto, 1995; Pfeifer & Waeltly, 1995) and generally happier (Clark et al., 1999). Life satisfaction and attending church were also positively related to one another net of health and sociodemographic variables among older Mexican-Americans (Levin, Markides, & Ray, 1996).

In a study of older rural parents, participants who were more religious were happier than participants who were less religious (Harvey, Bond, & Greenwood, 1991). Among male participants, those with greater levels of religious involvement were more likely to report being satisfied with life than male participants with less religious involvement (Harvey et al., 1991).

Positive emotions such as happiness may be used as proxy variables in measuring life satisfaction. Elderly participants living in metropolitan settings that were members of a religious organization and who attended religious services were more likely to indicate feeling “happy” than elderly participants who did not belong to any religious organization (Mookherjee, 1998). Blazer and Palmore (1976) also found a positive relationship between happiness and participation in religious activities (e.g., attending church) among elderly participants. Elderly individuals in nursing homes who practiced religion and were high in religious commitment were more likely to be happy than their non-religious counterparts (Rai, Jetten, Collas, Hoefnagels, et al., 1995). By contrast, attitudes towards Christianity were unrelated to happiness among a sample of undergraduates (Lewis, Lanigan, Joseph, & de Fockert, 1997).

Hostility and Aggression

Hostility and aggression also appear to be lower among individuals with greater religious involvement. In a comparison of a secular kibbutz to a matched religious kibbutz, members of the secular kibbutz were found to have higher hostility scores (Kark, Carmel, Sinnreich, Goldberger, & Friedlander, 1996).

Self-Esteem

High self-esteem or the extent to which people hold positive appraisals of themselves and their self-worth is also associated with religious involvement. That is, religious involvement may have beneficial effects by helping to maintain and augment feelings of self-worth (Krause & Van Tran, 1989). Homemakers reporting that their religious beliefs were important had higher self-esteem than homemakers who reported that religious beliefs were unimportant (Meisenhelder, 1986). College students high in religiosity were also more likely

to have high self-esteem than college students low in religiosity (Jensen et al., 1993; Knox, Langehough, Walters, & Rowley, 1998; Maltby et al., 1999). By contrast, extrinsically religious college students are more likely to have lower self-esteem (Genia, 1998; Maltby et al., 1999) than intrinsically religious college students.

Church attendance also appears to be positively related to self-esteem (Forst & Healy, 1990; Sherkat & Reed, 1992). Women who attended church frequently prior to being admitted to a nursing home were more likely to have high self-esteem than women who attended church less often (Commerford & Reznikoff, 1996).

Among African-Americans, self-esteem was related to participation in private religious activities (e.g., prayer, reading the Bible) and public religious activities (e.g., attending church; Ellison, 1993; Krause & Van Tran, 1989). Elderly individuals with an intrinsic religious orientation were more likely to have high self-esteem scores than elderly individuals with an extrinsic religious orientation (Nelson, 1990).

Krause (1995) suggests that the relationship between self-esteem and religiosity may be non-linear. Individuals reporting the least as well as the greatest amount of religious involvement were more likely to have high self-esteem, whereas individuals with moderate levels of religious commitment were less likely to have high self worth.

Several studies also indicate that self-esteem is unrelated to religious involvement. Importance of religious beliefs was not associated with self-esteem among employed women (Meisenhelder, 1986) and among participants from a Christian Network (Rasmussen & Charman, 1995). Intrinsic religious orientation was also unrelated to self-esteem among nursing home residents (Commerford & Reznikoff, 1996).

Possible Mechanisms Linking Religion with Health and Well-Being

Although religious involvement may influence health and well-being directly, it is also possible that it exerts its influence indirectly. A variety of mechanisms may explain the link between religious involvement and health and well-being. They include (a) social support, social ties, and social participation, (b) the use of religion as a coping strategy, and (c) good health practices as prescribed by religious involvement.

Social Support/Networks/Social Ties/Social Participation

Individuals who have close relationships are less likely to suffer from the damaging effects of adverse life events (e.g., decrease in morale, depression; Brown & Harris, 1978). Religious involvement may affect health and well-being by providing opportunities for individuals to have close relationships with other people. That is, interpersonal relationships with others may be a mechanism by which religious involvement confers its benefits. Intimate relationships with others can buffer the effects of stressful life events on mental and physical health (Cohen & Wills, 1985). High frequency of church attendance is associated with larger social networks, a larger number of contacts with network members, and higher perceived quality of social support (Ellison & George, 1994).

Social ties may be an important mediating variable when examining the effects of religious attendance on cause-specific adult mortality. Attending religious services appears to protect individuals from the risk of premature death (e.g., diabetes, infectious diseases; Hummer et al., 1999). The effects of attending religious services remain significant after controlling for the effects of size of social network and social support (Russell et al., 1998). Church members with high stress who perceived high social support from their congregation

reported greater levels of well-being than church members perceiving low social support (Maton, 1989). By contrast, well-being did not differ among church members with low stress and either high or low perceived social support. This finding suggests that churches providing high levels of social support may buffer the effects of stress on health for their members (Maton, 1989).

Churches and the supportive environments associated with them may foster feelings of usefulness, a sense of community, and feelings of acceptance, and may also reduce feelings of loneliness and depression (Steinitz, 1981). Among nursing home residents, depression and social support are related to religious coping. When sociodemographic and physical health factors are examined, the relationship between depression and religious coping is no longer significant. However, social support is positively related to religious coping among nursing home residents (Koenig, Weiner, Peterson, Meador, & Keefe, 1997). In addition, social support was found to mediate the relationship between religious coping and life satisfaction among renal transplant patients and their caregivers (Tix & Frazier, 1998). Perceived social support also mediates the relationship between religious involvement and depression (Husaini, Blasi, & Miller, 1999).

Religious involvement continues to predict health and well-being net of the influence of social support (Russell et al., 1998). A study examining whether church attendance was associated with lower levels of blood pressure found that church attendance was negatively associated with high blood pressure after controlling for the influence of social support (Walsh, 1998).

The effects of social support on religious involvement may also be moderated by gender. An attempt to determine whether social support could explain the relationship

between religious involvement and depression found that social support was related to lower depression scores among women who attended church regularly but not among men who attended church regularly (Hintikka, Vinaemaki, Koivumaa Honkanen, Tanskanen, & Lehtonen, 1998).

Religion as a Coping Strategy

Religious involvement may buffer the effects of stress and traumatic events by providing a means by which people can cope with stressful situations that may arise. Having faith is a coping strategy that may help alleviate the negative effects of adverse life events (e.g., bereavement, terminal illness, disabilities). Religious involvement or belief in God may provide individuals with a sense of purpose and meaning (George et al., 2000).

Individuals with stronger religious beliefs are less likely to feel the impact of traumatic life events (Ellison, 1991). They are also more likely to have a greater sense of optimism (i.e., a belief that they can cope with a stressful situation; Carver, Scheier, & Weintraub, 1989; Fry, 1995). In times of stress, individuals may turn to God in seeking solace and comfort.

Among individuals diagnosed with HIV/AIDS (Rokach, 2000; Rokach & Brock, 1998) and individuals recovering from an acute myocardial infarction (Walton, 1999), turning to religion can provide comfort, peace, and inner strength. Anxiety was less likely to be reported among HIV-infected African-American women who utilized religious coping (Woods, Antoni, Ironson, & Kling, 1999b). Similarly, lower scores on measures of depression were more likely among HIV infected gay men who utilize religious coping (Woods, Antoni, Ironson, & Kling, 1999a).

Religious and spiritual coping also has an indirect relationship with depression through its effects on the quality of the relationship between the caregiver and recipient of

care. That is, caregivers who engaged in religious coping were more likely to report good relationships with the recipient of care. Caregiver and care recipient dyads with better quality relationships were less likely to experience depression (Chang, Noonan, & Tennstedt, 1998). Caregivers with positive religious appraisals of their situation (i.e., belief that the situation is part of God's plan) have more positive outcomes than those caregivers who appraise their situation negatively (i.e., punishment from God, unfair; Mickley, Pargament, Brant, & Hipp, 1998). Among caregivers of patients with HIV/AIDS, religious involvement was associated with perceiving the burden of caregiving as less stressful (Folkman, 1997).

The loss of a loved one is often followed by grief. Researchers have found that individuals often turn to their religious beliefs in order to reduce the emotional distress associated with loss. A qualitative study examining the relation between such beliefs and coping with the death of a partner found that spiritual beliefs did not lessen the sense of loss associated with the partner's death, although it did provide a sense of support and comfort (Golsworthy & Coyle, 1999). Among widows/widowers, psychological well-being was found to be higher among those who indicated that religion was important in their lives (Fry, 2001). Frequent church attendance also helps in coping with the loss of a child (e.g., Sudden Infant Death Syndrome, neonatal death, or stillbirth). Parents who attend church frequently experience less anxiety and depression following the loss of a child than parents who attend church less often (Thearle et al., 1995). Following the death of a parent, adolescents who reported higher levels of religious involvement and spirituality had lower depression scores than adolescents who did not rely on their religious beliefs for comfort (Gray, 1987).

Recently diagnosed cancer patients as well as patients who have survived at least five years after an initial diagnosis of cancer (e.g., breast, Hodgkin's lymphoma) also reported

that their religious beliefs and involvement (e.g., prayer, meditation) were important in being able to cope with their diagnosis/prognosis (Feher & Maly, 1999; Fredette, 1995; Halstead & Fernsler, 1994). Among patients with breast, lung, or colorectal cancer, religious coping was associated with better psychological well-being and mental health status (Ell, 1989).

Spiritual well-being was also positively associated with perceived quality of life among breast cancer survivors (Cotton, 1999). Kidney transplant patients interviewed 3 and 12 months following their transplants who utilized religious coping to deal with effects of the transplant were more likely to be satisfied with their lives than kidney transplant patients that did not utilize religious coping (Tix & Frazier, 1998). In addition, elderly patients utilizing higher levels of religious coping were less likely to report cognitive symptoms of depression (e.g., boredom, helplessness, downheartedness) than patients who used lower or moderate levels of religious coping (Koenig, Cohen, Blazer, Kudler, & et al., 1995).

Religious beliefs (e.g., frequency of prayer, relationship with God) have also been found to be important in recovering from the influence of drugs and alcohol. Users who reported higher levels of religious beliefs were more likely to be optimistic and to have greater levels of social support (Pardini, Plante, Sherman, & Stump, 2000). Increase in the frequency of church attendance is also associated with a reduction in the use of cocaine and alcohol among recovering drug and alcohol users (Richard, Bell, & Carlson, 2000).

Frequency of church attendance was associated with suicidal ideation among Mexican immigrants. Mexican immigrants who attend church frequently are less likely to report suicidal ideation than Mexican immigrants who attend church less frequently, suggesting that religious involvement protects immigrants against risk of death due to suicide (Hovey, 2000).

Prayer is often cited as a mechanism for coping with various stressors. Prayer provides the individual with an opportunity for meditation and reflection (Friedman, 2002). Engaging in prayer may help to reduce stress for many people. Asian Indian women suffering from depression reported they were able to cope with their depression through prayer (Jambunathan, 1992). Prayer also appears to have a positive effect on being able to cope with the stress associated with postoperative coronary artery bypass surgery (Ai, Bolling, & Peterson, 2000; Ai, Dunkle, Peterson, & Bolling, 1998). African-American participants diagnosed with hypertension reported that prayer was important in coping with their disease (Brown, 2000).

Religious involvement may be helpful in coping with stressful situations but may not have the same effect under less stressful situations. For example, strength of religious faith was not found to be associated with coping with daily stress and hassles (Plante, Saucedo, & Rice, 2001).

Although religious involvement is positively associated with health and well-being, negative religious coping may be detrimental to health. Individuals who engage in negative religious coping are more likely to believe that God has abandoned them or that their suffering and predicament is some form of retribution for sinful behavior. Therefore, individuals who utilize negative religious coping may be angry with God and question why God singled them out. By contrast, individuals who engage in positive religious coping believe that God has a reason for His/Her actions and that there is some meaning to their suffering or predicament. A small sample of patients in medical rehabilitation (96; diagnosis included joint replacement, amputation, stroke, and other conditions) who engaged in negative religious coping were compromised in their ability to recover from their illness.

Patients who were angry with God or believed that God had abandoned them were less likely to achieve autonomy in performing activities of daily living (ADLS; Fitchett, Rybarczyk, DeMarco, & Nicholas, 1999). By contrast, positive religious coping was not helpful in adjusting to or recovering from impaired ADL functioning (Fitchett et al., 1999).

The use of religious involvement as a coping mechanism may also differ as a function of ethnicity. African-American adolescents were more likely to report using spiritual support in managing problems or difficult situations than were Caucasian adolescents (Chapman & Mullis, 2000). African-American elderly participants from senior citizen centers were also more likely to report using religion in coping with difficult situations or depression than were Caucasian elderly participants (Rosen, 1982).

Good Health Practices Prescribed by Religious Doctrine

Religious involvement may be protective through its relationship to good health practices (e.g., avoidance of smoking and drinking) and increased social contacts (Strawbridge et al., 1997; Strawbridge, Shema, Cohen, & Kaplan, 2001). Certain religious doctrines may discourage or prohibit engaging in behaviors (e.g., smoking, alcohol use) believed to be detrimental to health and well-being. Abstaining from alcohol among elderly participants in Canada was related to religious involvement (Graham, 1998). Individuals who were lifetime abstainers as well as individuals who were former drinkers were more likely to endorse religious reasons for abstaining from alcohol use. Attending religious services is also related to whether individuals drink or smoke. People who attend religious services on a weekly basis or identify themselves as highly spiritual are less likely to smoke and drink alcohol (Clark et al., 1999; Oman & Reed, 1998; Strawbridge et al., 1997, 2001; Szaflarski, 2001; Waite, Hawks, & Gast, 1999). Women in particular appear to benefit from

the relationship between church attendance and cessation of poor health behaviors (e.g., smoking and heavy drinking; Strawbridge et al., 2001). Among African-American males, low church attendance was associated with smoking and drinking alcohol on a daily basis (Brown & Gary, 1994). Among high school and college students, drug (e.g., marijuana, cocaine; Grunbaum, Tortolero, Weller, & Gingiss, 2000) and alcohol use were negatively associated with frequency of church attendance (Moore, Laflin, & Weis, 1996). Belief in God was also associated with a lower frequency of alcohol intoxication among adolescents in Norway (Wichstrom, 1998).

Medical students in a Norwegian sample had close to a two times greater risk of using alcohol to cope with tension and a four times greater risk of engaging in hazardous drinking if they did not participate or engage in any type of religious activity (Tyssen, Vaglum, Aasland, Gronvold, & Ekeberg, 1998). In a cross-sectional study of urban African-American male adolescents, individuals who indicated they were high in spirituality (e.g., having a close personal relationship with God) were less likely to use marijuana or hard drugs (Maton & Zimmerman, 1992).

Some interesting and occasionally contradictory findings among individuals with higher rates of religious involvement (e.g., attendance, spirituality) include exercising more often (Oman & Reed, 1998; Waite et al., 1999) and greater likelihood of being overweight (Clark et al., 1999; Oman & Reed, 1998; Strawbridge et al., 1997). Religious involvement may also contribute to good health through its influence on having regular medical checkups. For example, individuals who attended church on a weekly basis were more likely to undergo routine medical check ups (Strawbridge et al., 2001). However, this relationship appears to

benefit those individuals who had an established medical regimen rather than individuals who had not yet initiated such a regimen (Strawbridge et al., 2001).

Church-based community intervention programs have also been effective in promoting health screening (including mammography; Fox, Stein, Gonzalez, Farrenkopf, & Dellinger, 1998; Fox, Pitkin, Paul, Carson, & Duan, 1998) and prostate cancer screening (Boehm, 1995) to parishioners.

Measurement Issues

The relationship between religious involvement and positive health is not clear. Many researchers examining this relationship employ cross-sectional data where cause and effect are difficult to ascertain (George et al., 2000). A study examining the effects of spiritual beliefs on recovery from illness found that higher levels of spiritual beliefs were related to worse outcomes (i.e., health worsened, death; King, Speck, & Thomas, 1999). The findings of this study may suggest that individuals who are gravely ill and have a poor prognosis may turn to religion when faced with an uncertain future. However, because the study began with admission to the hospital, no information about the strength of religious beliefs prior to hospital admission is available. Therefore, it cannot be concluded that religious beliefs are a predictor of worse outcomes such as death or poor health.

It is also difficult to determine the relationship between religious involvement and health and well-being when the effects of other factors (e.g., social support, health status) are not controlled in the analysis. For example, a study examining the link between religious attendance and subjective health among three generations of Mexican-Americans found that when the effects of social support, physical capacity, and social class were controlled, the relationship between religious involvement and subjective health was no longer significant

(Levin & Markides, 1986). The study by Levin and Markides (1986) exemplifies the difficulties in identifying the link between religious involvement and health outcomes. In this study, the authors used a single-item measure of subjective health (i.e., respondents were asked to rate their health on a four point scale ranging from *poor* to *excellent*) to measure health. Therefore, it may be possible that the link between religious involvement and subjective health was underestimated because a single-item measure is not as reliable as a multi-item measure.

Summary

The relationship between religious involvement, health and well-being has increasingly captured the attention of researchers over the past 10-15 years. In general, religious involvement has been shown to affect health and well-being (e.g., mortality, cardiovascular disease, mental health problems, loneliness, etc). However, the majority of studies described have typically been focused on determining whether the relationship between these variables exist, leading to the interesting conclusion that religious involvement may confer positive benefits on health and well-being. Possible mechanisms (e.g., use of religious beliefs as coping strategies, good health practices prescribed by religion) linking religious involvement, health, and well-being were also examined.

Overview of the Study

The goal of this study was to examine the relationship between religious involvement, depression, and perceived health. As discussed previously, the majority of studies examining the effects of religious involvement on depression and health have relied on the use of single indicators of religious involvement (e.g., frequency of church attendance) at a specific point in time. This study seeks to expand upon previous research in this area by conducting a two-

wave longitudinal study, utilizing several indicators of religious involvement and assessing participants' depression and health at two time points. It provides an opportunity to explore the relationship between religious involvement and health and well-being in greater detail.

Based on previous findings, we predicted that greater religious involvement would be associated with less depression, better health, and fewer visits to health care providers initially (i.e., Time 1). If religious involvement confers positive benefits then we would expect it to continue to be predictive of depression and health over time (i.e., Time 2) after controlling for the initial effects of depression and health. Previous findings also suggest that women are more likely to benefit from religious involvement than men.

Structural equation modeling (SEM) techniques were used to analyze the data collected from participants at several Midwestern colleges. This approach allows researchers to test specified models while examining the relationships among the constructs. It also allows for the examination of both direct and indirect effects among the variables. Using SEM techniques to examine the relationships between religious involvement, depression, perceived health, and frequency of seeking health care services may provide additional information regarding mechanisms by which religious involvement influences health and well-being. In addition, SEM techniques were used to examine whether the effects of religious involvement on health and well-being differed for men and women.

CHAPTER 3. MATERIALS AND METHODS

Participants and Procedures

Participants were recruited to take part in this two-part longitudinal study from the Iowa State University Department of Psychology's Research Participant Pool and from the Campus Christian Fellowship, a student religious organization affiliated with Iowa State University, the University of Iowa, and the University of Northern Iowa. The Campus Christian Fellowship was targeted for recruitment to ensure a sufficient number of participants with high levels of religious involvement. As an incentive, participants recruited from the Department of Psychology received 2 extra credit points in exchange for their participation in the study. Participants recruited from the Campus Christian Fellowship agreed to take part in exchange for the opportunity to win \$50.00 via a lottery.

Prior to agreeing to take part in the study, participants were informed that this was a two-part longitudinal study and that they would be asked to take part once during August and September, 2002, and again in December, 2002. At time 1, participants were asked to come to a laboratory where they were administered a battery of questionnaires assessing religious beliefs/attitudes, participation in public and private religious activities (i.e., frequency of church attendance and prayer), depression, perceived health, and frequency of seeking health care services. At time 2, participants were again asked to complete the questionnaires regarding depression, perceived health, and frequency of seeking health care via a website. In exchange for taking part in the second half of the study, participants recruited from the psychology participation research pool were given 3 extra credit points (2 extra credit points plus 1 additional credit for completing both sections of the study). Participants recruited

from the Campus Christian Fellowship were given a second opportunity to win \$50.00. For descriptive information on participants see the Results Section (Chapter 4).

Measures

Sociodemographic variables. Participants were asked a series of questions designed to assess sociodemographic characteristics that may influence the effects of religious involvement on health and well-being. Specifically, participants were asked their age, education, race/ethnicity, sex, and marital status. Participants were also asked to indicate their religious affiliation as well as their parents' religious affiliation.

Religious Orientation Scale. To assess participants' beliefs and attitudes, three measures of religious involvement were administered. The first measure of religious beliefs/attitudes administered was the *Religious Orientation Scale* (ROS; Allport & Ross, 1967). The ROS is comprised of two subscales: the Intrinsic Religious Orientation Scale and the Extrinsic Religious Orientation Scale (Allport & Ross, 1967). The Intrinsic Religious Orientation measure assesses the extent to which individuals "live" their religion. Individuals who are high in intrinsic religious orientation are motivated by the traditions and teachings of their religion. By contrast, the Extrinsic Religious Orientation measure assesses the extent to which individuals endorse religious beliefs and attitudes or engage in religious behavior in order to gain some form of advantage or social approval. Individuals who are high in extrinsic religious orientation are motivated by the benefits that may be derived as a result of their religious involvement. The scale consists of 20 questions (9 Intrinsic and 11 extrinsic), and participants are asked to indicate the extent with which they agree or disagree with the items on a five-point Likert scale that ranges from 1=*strongly disagree* to 5=*strongly agree*. The reliability for the Intrinsic Religious Orientation Subscale is in the mid .80s. The

reliability of the Extrinsic Religious Orientation Subscale is somewhat lower, with Cronbach's alphas in the .70s (Burriss, 1999). Reliabilities of the intrinsic and extrinsic orientation scores in the current study are shown in Table 1.

Spiritual Well-Being Scale. Participants were also asked to complete a subscale of the *Spiritual Well-Being Scale* (SWB; Ellison, 1983; Paloutzian & Ellison, 1982). The SWB is a 20-item questionnaire used to assess two dimensions of subjective quality of life (Boivin, Kirby, Underwood, & Silva, 1999). Participants were asked to consider their relationship with God by indicating the extent to which they agreed or disagreed (ranging from 1 = *strongly disagree* to 6 = *strongly agree*) with each of the 10 items assessing religious well-being. For example, one item is, "I believe that God loves me and cares about me." Reliability for the religious dimension ranges from .88 to .99 (Boivin et al., 1999). Reliability of the scale in the present study was also good (see Table 1). The second dimension reflects a social psychological component (i.e., self-adjustment, adjustment with the community, and adjustment with surroundings; Boivin, 1999). The second dimension was omitted because it was not specifically related to religious involvement or beliefs.

Religious Locus of Control. The third measure of religious beliefs/attitudes administered was the *Religious Locus of Control Scale* (RLOC; Gabbard, Howard, & Tageson, 1986). The RLOC Scale is based on Rotter's (1966) Internal vs. External Locus of Control Scale. The RLOC was used to assess the extent to which participants believe they have control over their own lives (internal) versus the extent with which participants believe that outcomes are due to chance (external). The religious version of the LOC substitutes

Table 1
Range of Item-Total Correlations and Coefficient Alphas for Measures Used in Study

	Time 1		Time 2	
	Item -Total Correlations (Range)	α	Item -Total Correlations (Range)	α
<i>Perceived health and Depression</i>				
SF-12 Health Survey	.18 - .54	.75	.26 - .68	.83
SF-12 8- Item Health Survey	.22 - .48	.68	.31 - .51	.71
CES Depression Scale	.33 - .73	.90	.29 - .80	.93
<i>Measures of Religiosity</i>				
Intrinsic Religious Orientation	.40 - .74	.87		
Extrinsic Religious Orientation	.17 - .47	.70		
Spiritual/Religious Well-Being	.67 - .87	.95		
Religious Locus of Control	-.07 - .38	.55 ¹		
Structure of Prayer:				
Petition	.55 - .73	.80		
Ritual	.57 - .74	.81		
Habit	.59 - .80	.86		
Confession	.67 - .81	.90		
Meditation/Improvement	.70 - .83	.90		
Compassionate Petition	.65 - .86	.95		

$N = 185$

¹ KR-20

words that refer to chance, luck, or fate (i.e., external control) with religious external control references (e.g., God's help, spiritual powers). This 29-item forced-choice scale includes 23 items that are scored and 6 distractor items. Participants are asked to choose one of two statements worded to reflect either external or internal locus of control with which they agree most. Participants' scores reflect the number of external locus of control items they selected. Therefore, high scores on this measure reflect an external religious locus of control (i.e., the belief that their fate is controlled by God). Reliability information for this scale was not provided in the paper by Welton (1999). Reliability for the scale in this study was rather low ($r_{KR-20} = .55$; see Table 1).

Structure of Prayer Scale. Participants' private religious behavior was also assessed. To assess the nature of participants' prayers, participants were asked to complete the *Structure of Prayer Scale* (Luckow et al., 1997, cited in David, 1999). The scale is a 28-item measure developed to assess six dimensions of prayer: confession (sharing life with God, feelings of guilt, sin; e.g., "It is important to me to tell God about my sins or faults"), petition (asking for help or favors; "When I pray, I ask God for special favors"), ritual (extent to which prayers follow a strict routine; "When I pray I have certain words or phrases that I repeat a number of times"), meditation-improvement (engaging in prayer provides sense of security or inner well-being; "Prayer helps me keep my life balanced and happy"), habitual (prayer at set times of the day; "I always pray before I go to sleep"), and compassionate petition (prayer is utilized to thank God for prayers answered and help for loved ones; "I pray to give thanks for all God has done for me"). Participants are asked to rate the extent to which each of the items presented reflects their personal practices (1 = *strongly disagree*, 6 = *strongly agree*). In general, the subscales have good reliability, with Cronbach's alphas

ranging from .62 to .95 across several samples (e.g., university students, cancer patients; David, 1999). However, among samples of highly religious individuals (i.e., students attending Christian Colleges) the reliability of three of the subscales (e.g., confession, petition, and meditate-improvement) is lower, with reliabilities of .58, .44, and .19, respectively. The low reliability among highly religious individuals may reflect restriction of range because students' responses did not vary greatly. For the present study, reliabilities were good (see Table 1).

Other Public and Private Religious Behavior: To gather information about participants' public religious behavior, they were asked to indicate the frequency with which they attended church, religious meetings, or services (0 = *never*, 6 = *more than once a week*). In addition to learning about the nature of prayer, we also wanted to determine how often participants engaged in prayer. Therefore, participants were also asked to indicate how often they prayed (1=*never* to 6 = *more than once a day*).

Depression. To assess depression, participants completed the Center for Epidemiology Studies-Depression Scale (CES-D; Radloff, 1977). The CES-D is a 20-item scale that assesses the frequency of six depressive symptoms (e.g., depressed mood, feelings of guilt and worthlessness, problems sleeping, loss of appetite, feelings of helplessness and hopelessness, psychomotor retardation). Participants were asked to rate the frequency with which they experienced these symptoms within the last week, using a scale ranging from 0 = *rarely or none of the time* to 3 = *most of the time*. Possible scores range from 0 to 60, with higher scores reflecting more depressive symptoms. Previous research indicates that internal consistency is very good, with Cronbach's alpha ranging from .85 for the general population

to .90 for a psychiatric population (Radloff, 1977). Reliabilities for the current study are presented in Table 1.

Perceived Physical Health. Participants' self-reported health status was assessed by the SF-12 Health Survey (Ware, Kosinski, & Keller, 1996), an abbreviated version of the SF-36 (Ware & Sherbourne, 1992). This scale was developed to assess two dimensions of health-related quality of life: physical (i.e., PCS-12; physical functioning, limitations in role functioning due to physical problems, bodily pain, and general health) and mental health (i.e., MCS-12; vitality/energy, social functioning, limitations in role functioning due to emotional problems, and mental health). Each response on the SF-12 is weighted, and the 12 items are summed to yield two scores, a physical component summary score and a mental health component summary score. Reliabilities for the PCS-12 (Cronbach alphas range from .86 to .89) and the MCS-12 (Cronbach alphas range from .76 to .77) are good (Ware et al., 1996).

For this study, only eight items from the SF-12 were used. The eight items (i.e., items 1, 2, 3, 4, 5, 8, 10, 12) were selected because they assessed physical health status. The other four items were eliminated because they reflected mental health (items 6, 7, 9, 11). Reliability scores for the Time 1 and Time 2 assessments are presented in Table 1.

Seeking Health Care. To determine the frequency of seeking health care services, a single item asked participants to indicate the number of times they had gone to a health care provider (e.g., physician, nurse practitioner, etc.) during the previous six months for a non-injury related illness at Times 1 and 2. This measure was an open-ended item with responses ranging from 0 to 25 during the past six months. To control skewness, responses on this scale were recoded 0 to 4 with a score of 4 reflecting 4 or more visits. Because there was an

overlap in time between the Time 1 and Time 2 responses on this measure, only Time 2 responses were used in the analysis.

CHAPTER 4. RESULTS

Characteristics of the Time 1 Participants

A total of 251 students participated at Time 1. The majority (88%) of participants were recruited through the Department of Psychology's research participation pool. The remaining 12% of participants were recruited from Campus Christian Fellowship members at three campuses. Participants ranged in age from 18 to 39 years ($M = 20$ years, $SD = 2.19$), and the majority of the students were female (66%), single (97%), and White (88%; 4% African-American, 3% Latino, 4% Southeast Asian, 1% other). Most of the participants (79%) were in their first or second year of college.

Participants were asked how often they attended religious services. Approximately one-third (32%) of participants indicated they attended religious services 1 or more times per week, 24% attended services 1-3 times per month, and 37% attended 1-11 times per year. The remaining participants (7%) indicated they never attended religious services.

Participant attrition. One issue that arises in any longitudinal investigation involves the influence of participant attrition on the results of the analyses. Of the 251 participants at Time 1, 26% ($n = 66$) did not participate at Time 2. The majority (53%) of students who did not participate at Time 2 were female and were recruited from the psychology participation pool (98%). Analyses were conducted to test for differences between these participants and participants who completed both surveys ($n = 185$) on the variables that were assessed at Time 1 (see Table 2). Participants who dropped out after Time 1 were more likely to have higher extrinsic religious orientation scores than participants who continued onto Time 2 ($t [249] = 2.66, p < .01$). The two groups of participants did not differ in their scores on any of the other various measures of religiosity, depression, or perceived health.

Table 2**Comparisons between students who did and did not participate at Time 2**

	Participated (<i>n</i> = 185)		Did Not Participate (<i>n</i> = 66)		<i>t</i>
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	
<i>Measures of Religiosity</i>					
Intrinsic Religious Orientation	28.50	7.79	27.25	6.97	-1.15
Extrinsic Religious Orientation	28.30	5.80	30.45	5.21	2.66**
Religious Well-Being	43.63	11.49	43.32	11.68	-.19
Religious Locus of Control	11.82	3.31	12.21	3.07	.84
Structure of Prayer Subscales					
Meditation/Improvement	19.49	6.40	20.06	6.35	.63
Compassionate Petition	36.96	10.05	35.03	10.40	-1.33
<i>Religious Behavior</i>					
Religious Service Attendance	4.22	1.98	3.76	1.77	-1.70
Prayer	4.68	1.89	4.71	1.73	.12
<i>Perceived health/Depression</i>					
Health (SF-12; 8-item total)	25.85	2.89	26.06	2.83	.50
Depression (CES-D)	14.21	9.44	13.42	7.48	-.61

** $p \leq .01$ **Characteristics of Time 2 Participants**

Seventy-four percent ($n=185$) of participants who took part in the study at Time 1 agreed to take part in the second wave of data collection. Of the participants who completed Time 2 questionnaires, 84% were initially recruited from the Department of Psychology's Research Participation Pool whereas the remaining 16% were recruited from the Campus Christian Fellowship student organization. The second set of analyses involves a longitudinal examination of the effects of religiosity on depression and perceived health and

well-being. Therefore, only the 185 participants who took part in both waves of data collection were included in these analyses.

Approximately one-third (34%) of these latter participants indicated they attended religious services 1 or more times per week, 25% attended services 1-3 times per month, and 33% attended 1-11 times per year. The remaining participants (8%) indicated they never attended religious services. Most of the participants reported they did engage in prayer, with only 6% indicating they never prayed. The frequency with which participants prayed varied from 2 or more times per day (23%), 1 time per day (15%), 1-6 times per week (31%), 1-3 times per month (12%), to less than once per month (12%).

The majority of participants (57%) indicated their religious preference was Protestant. Approximately one-third (28%) indicated they were Roman Catholic, 7% were “other,” and 7% indicated no religious preference. Participants who indicated a Protestant religious preference were also asked to indicate their denominational preference. Denominational preferences varied among the Protestant participants; 25% indicated they were Lutheran, 23% were non-denominational, 20% were Methodist, 10% were “other,” with 5% each indicating Baptist, Presbyterian, Pentecostal/Assembly of God, and Church of Christ.

Participants’ were also asked to indicate their parents’ religious preferences. Parents’ religious preferences were related to the participants’ ($r = .67, p \leq .01$), with the majority (53%) indicating Protestant and 28% indicating Roman Catholic. Protestant parents’ denominational preferences were also related to that of the participants ($r = .68, p \leq .01$).

Norm-Referenced Comparisons. One-sample *t*-tests were conducted to determine whether there were differences between depression and perceived health scores derived from participants relative to norms on these measures. To compare participants’ depression

scores, CES-D norms based on a population of adults 25-34 years of age were used (Sayetta & Johnson, 1980). It should be noted that the norm group was somewhat older than participants in this study (i.e., age range was 19-39, $M=19.87$ years). Overall, participants were more likely to be depressed than the reference group (see Table 3). Participants in this study scored approximately 5 to 6 points higher on the depression measure than the comparison group. This difference is approximately .5 standard deviation, a moderate effect size according to Cohen (1988). Female participants in this study had slightly higher rates of depression than male participants, and also had higher rates of depression than the female comparison group. Male participants also had higher rates of depression than the male comparison group.

Table 3
Participants' Depression Scores Compared to Norms

	<i>Participants' Depression</i>		<i>Reference Group</i>	<i>t</i>
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	
Males	13.33	10.05	7.1	4.55**
Females	14.57	9.19	10.00	5.69**
25-34 year old	14.21	9.44	8.5	8.22*

Note: ** $p \leq .01$, * $p \leq .05$

We also compared participants' scores on perceived health with scores derived from norms. To compare participants' perceived health with a reference group, a total score was derived by first weighting participants' responses on the SF-12 health survey and then summing the weighted responses. The total score derived from the SF-12 that was used in the analysis was based on 8 items rather than all 12 items (see Time 1: The Cross-Sectional Model).

Norms were available for various groups (i.e., 18-34 age group, males, and females). In addition to an overall mean for the various groups, norms are provided in terms of percentile ranks (i.e., 25th, 50th, and 75th). The overall mean among participants was at the median for the norm group (see Table 4). The mean for male participants was at the 75th percentile of the male norm group and the mean for female participants was between the 50th and 75th percentile of the female norm group. The difference between the overall mean for men and women in the reference group and the men and women in the study reflected a large effect size ($d = .82$, and 1.06 , respectively) according to Cohen (1988).

Table 4

Participants' Perceived Health Compared to Normed Groups

	Participants' Perceived Health		Reference Group	<i>t</i>
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	
18-34 Age Group (Overall)	55.33	5.77	53.33	4.72**
SF-12 50 th percentile			55.18	.36
Males (Overall)	56.23	6.11	51.22	6.02**
SF-12 75 th percentile			56.61	-.46
Females (Overall)			49.11	11.96**
SF-12 50 th percentile	54.96	5.60	52.76	4.50**
SF-12 75 th percentile			56.02	-2.16*

Note: ** $p \leq .01$, * $p \leq .05$

The Cross-Sectional Model

For the current study, only data collected from students who participated at both Time 1 and Time 2 were used. The original sample of 185 students was further reduced to 184 students because of missing religious and health and well-being data for one student. Table 2

($n=184$) presents descriptive statistics for the variables that were included in the causal model.

The measurement model. A structural equation analysis was used to test the model shown in Figure 1, as operationalized by the maximum likelihood method of LISREL (Version 8; Joreskog & Sorbom, 1993). An advantage of structural equation analysis over other causal modeling procedures based on ordinary least squares regression is the removal of random measurement error that tends to attenuate path coefficients. Errors of measurement in the independent variables that cause estimates of relations to be biased may be removed through the use of latent variables; as a consequence, such bias may be avoided.

The LISREL program also provides various indices of fit for the model; the chi-square statistic (χ^2), the comparative goodness of fit (CFI), standardized root mean residual (SRMR), and the root-mean-square-error of approximation (RMSEA) were used here. The chi-square test of the overall goodness of fit for the model measures the extent to which the hypothesized model is able to account for relations among the manifest or measured variables. The Comparative Fit Index (CFI) developed by Bentler (1990) is a population parameter that reflects the degree of improvement over a null model of independence that does not account for any of the association among model variables. CFI is a normed fit index ranging from 0 to 1.0; values of .95 or greater indicate a model that shows substantial improvement over the null model (see Hu & Bentler, 1999). The standardized root mean square residual (SRMR) is the average difference between the predicted and observed variances and covariances for the model, based on standardized residuals. SRMR is 0 when the fit of the model is perfect. Hu and Bentler (1999) have recommended using .08 as the

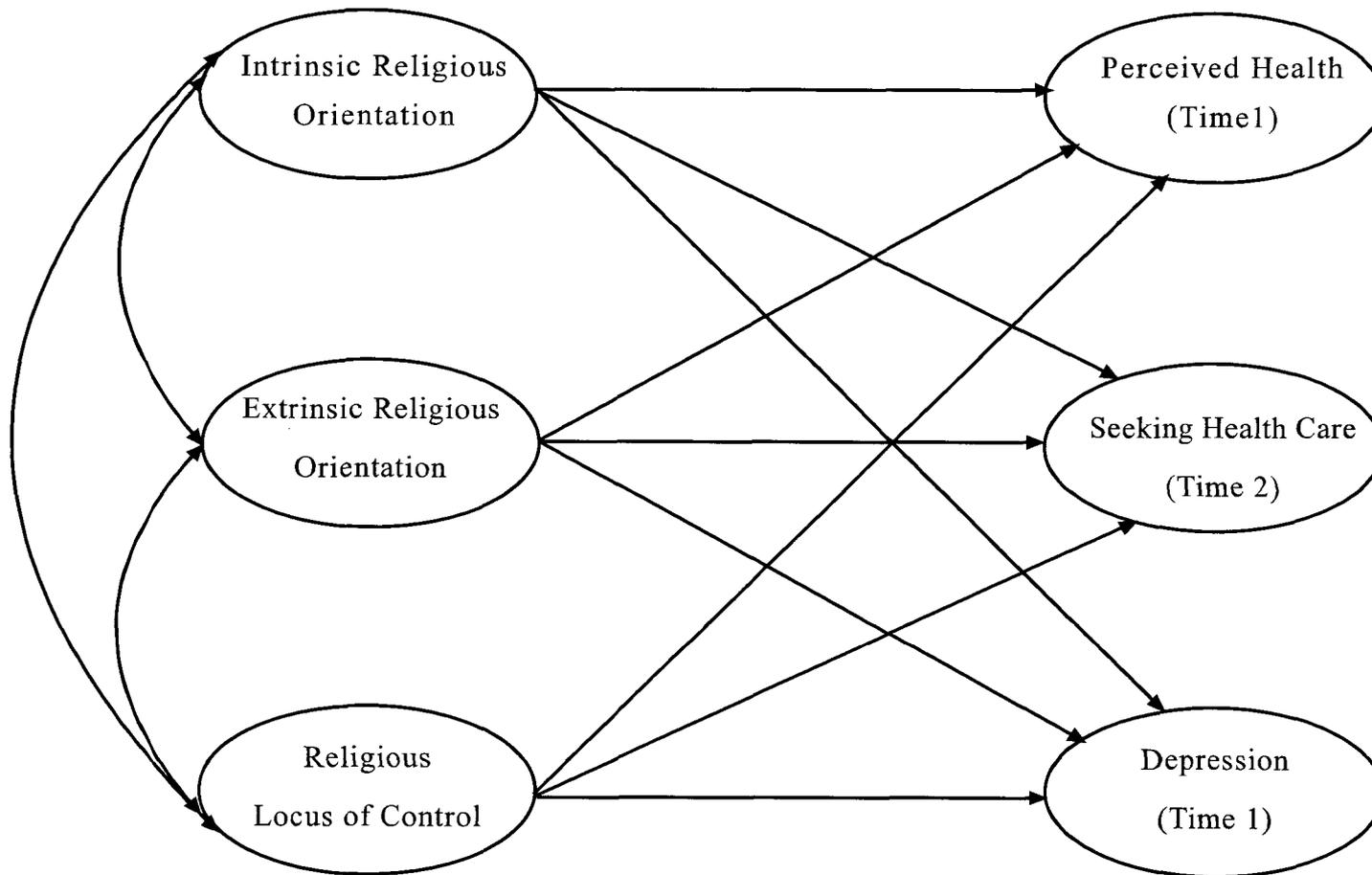


Figure 1. Time 1 Cross-Sectional Measurement Model

cut-off for a good model fit. The RMSEA represents the discrepancy in fit per degree of freedom for the model. A value of .05 or less indicates a close fit for the model, whereas values up to .08 represent reasonable errors of approximation in the population. Hu and Bentler (1999) recommend a RMSEA of less than or equal to .06 as a cutoff point.

The first step in testing the model involved the specification and testing of the measurement model. Five of the six variables were specified as latent variables in the analysis: intrinsic religious orientation, extrinsic religious orientation, religious locus of control, perceived health, and depression. The sixth variable, reflecting the frequency with which participants sought medical care during the previous 6 months, was specified as a manifest or measured variable.

A covariance matrix was used to test the measurement model. With the exception of extrinsic religious orientation and religious locus of control, the other measures of religiosity (i.e., intrinsic religious orientation, spiritual well-being, meditation-improvement [a structure of prayer subscale], compassionate petition [a structure of prayer subscale], frequency of attendance at religious services, and frequency of prayer) were strongly inter-correlated, with correlations ranging from .61 to .83 (see correlation matrix in Table 5). Therefore, these six measures were used to operationalize an overall intrinsic religious orientation latent variable. To specify this latent variable of intrinsic religious orientation, total scores were computed for the intrinsic religious orientation, spiritual well-being, meditation-improvement, compassionate petition, frequency of religious service attendance, and frequency of prayer measures.

To develop multiple indicators for the extrinsic religious orientation variable,

Table 5
Variances and Correlations Among the Measured Variables.

	Intrinsic	Spiritual WB	Meditation	Compassionate	Church	Prayer	Extrinsic1	Extrinsic2	Extrinsic3
Intrinsic	7.817								
Spiritual WB	.777**	11.519							
Meditation	.763**	.796**	6.420						
Compassionate	.745**	.834**	.823**	10.083					
Church	.765**	.662**	.613**	.635**	1.979				
Prayer	.769**	.772**	.732**	.750**	.740**	1.902			
Extrinsic1	.101	.051	.164*	.130	.055	.018	2.517		
Extrinsic2	-.465**	-.392**	-.306**	-.292**	-.439**	-.418**	.340**	2.571	
Extrinsic3	-.264**	-.202**	-.022	-.071	-.349**	-.270**	.483**	.526**	2.226
RLOC1	.197**	.236**	.220**	.271**	.335**	.268**	-.096	-.224**	-.263**
RLOC2	.211**	.202**	.201**	.202**	.254**	.216**	-.004	-.047	-.065
RLOC3	.236**	.200**	.206**	.214**	.220	.243**	-.058	-.092	-.205**
Seeking Health	-.115	-.087	-.080	-.065	-.048	-.017	.005	-.015	.101
GenHealth	-.007	.106	.078	.015	.021	.095	-.083	-.094	-.167*
ADL	-.162*	-.115	-.170*	-.172*	-.133	-.127	-.165*	.065	-.149*
Depression1	-.134	-.194**	-.132	-.178*	-.090	-.146*	.096	.129	.101
Depression2	-.157*	-.217**	-.177*	-.171*	-.097	-.149*	.117	.207**	.145*
Depression3	-.181*	-.237**	-.212**	-.216**	-.078	-.167*	.090	.207**	.048

Note: $n = 184$, ** $p \leq .01$, * $p \leq .05$; Standard Deviations of the measures are reported on the diagonal of the matrix

Table 5
Correlations among the variables used in study 1 (continued)

	RLOC 1	RLOC2	RLOC3	Seeking Health	GenHealth	ADL	Depression1	Depression2	Depression3
Intrinsic									
Spiritual WB									
Meditation									
Compassionate									
Church									
Prayer									
Extrinsic1									
Extrinsic2									
Extrinsic3									
RLOC1	1.640								
RLOC2	.323**	1.573							
RLOC3	.252**	.357**	1.276						
Seeking Health	.076	.005	.067	1.184					
GenHealth	-.169*	-.126	-.101	-.358**	2.330				
ADL	-.092	-.031	-.069	-.210*	.449**	.958			
Depression1	.157*	.284**	.065	.199**	-.509**	-.146	3.826		
Depression2	.128	.245**	.058	.223**	-.454**	-.124	.702**	3.551	
Depression3	.215**	.280**	.146*	.200**	-.471**	-.137	.741**	.788**	3.015

Note: $n = 184$, ** $p \leq .01$, * $p \leq .05$; Standard Deviations of the measures are reported on the diagonal of the matrix

confirmatory factor analysis fitting a one-factor model to the 11 measures was conducted. The items were rank ordered in accordance with their factor loadings and every group of three items was numbered 1, 2, and 3 based on the magnitude of their loadings. Three measured variables were derived by computing scores on all items numbered 1, all items numbered 2, and all items numbered 3. The same approach was used to develop multiple indicators for the religious locus of control (23 items) and depression (20 items) measures.

The variable of perceived health was derived from 8 of the 12 items on the SF-12 Health Survey. The remaining 4 items (assessing mental health) from the SF-12 Health Survey were omitted from the analysis because a measure of depression was already included in the analysis. An exploratory factor analysis using a principal axis components procedure suggested by Russell (2002) was conducted on the 8 SF-12 items. The exploratory factor analysis indicated two factors: a general health factor (GenHealth; 4 items) and an activities of daily living factor (ADL; 4 items). A perceived health latent variable was therefore derived by computing scores for these two factors; these factor scores were derived by summing together responses to items that loaded highly on each factor (see Russell, 2002).

In evaluating the measurement model, a six-factor model was tested with the factors (intrinsic religious orientation, extrinsic religious orientation, religious locus of control, frequency of seeking health care, perceived health, and depression) hypothesized to underlie the 18 measured variables described above. This model was found to provide a reasonable fit to the data, $\chi^2(121, n=184) = 283.70, p \leq .01$; CFI = .94; SRMSR = .09; RMSEA = .09. As

shown in Table 6, the standardized factor loadings of the measured variables on the latent factors ranged from 0.43 to 1.03² and were all highly significant.

Correlations among the factors are presented in Table 7. Intrinsic religious orientation was found to be negatively related to depression but was unrelated to perceived health. Extrinsic religious orientation and religious locus of control were both negatively related to perceived health and positively related to depression. None of the measures of religiosity (i.e., intrinsic religious orientation, extrinsic religious orientation, and religious locus of control) were related to the frequency of seeking health care services. The religious variables were related to one another in the direction expected. Intrinsic religious orientation was negatively related to extrinsic religious orientation and positively related to religious locus of control, and extrinsic religious orientation was negatively related to religious locus of control.

Results for the causal model. Because the specification of the variables in the measurement model appeared adequate, the causal model shown in Figure 1 was tested. The causal model was also found to provide a reasonable fit to the data, $\chi^2 (121, n=184) = 283.70, p \leq .01$; CFI = .94; SRMSR = .09; RMSEA = .09. The standardized path coefficients from this model are presented in Figure 2. As expected, intrinsic religious orientation was positively related to depression: participants high in intrinsic religious

² The standardized factor loading of 1.03 is an out-of-range value. This loading represents the standardized relationship between the measured general health variable and the latent variable of perceived health, and should not exceed 1.00. This result may have occurred due to the small number of measured variables (i.e., two) for this latent variable. Because this standardized loading was greater than 1.00, the loading for this variable was fixed at 1.00 and the error variance for this measured variable was constrained at zero. Running the model with the error variance of this measured variable set at zero added two degrees of freedom to the model but did not affect the overall fit of the model. With the exception of the loading of the general health variable on the latent variable perceived health, the factor loadings remained the same and the fit of the model was unchanged.

Table 6
Factor Loadings for the Variables

Variables	Unstandardized Factor Loading	Standard Error (SE)	Standardized Factor Loading
<i>Intrinsic Religious Orientation</i>			
Intrinsic	6.84*	0.46	0.87
Spiritual Well-Being	10.42*	0.66	0.90
Meditation/Improvement	5.61*	0.38	0.87
Compassionate Petition	8.99*	0.59	0.89
Church Attendance	1.53*	0.12	0.77
Prayer (frequency of)	1.64*	0.11	0.86
<i>Extrinsic Religious Orientation</i>			
Extrinsic1	1.37*	0.20	0.54
Extrinsic2	1.66*	0.20	0.65
Extrinsic3	1.87*	0.18	0.84
<i>Religious Locus of Control</i>			
RLOC1	0.96*	0.14	0.58
RLOC2	0.93*	0.13	0.59
RLOC3	0.63*	0.11	0.49
<i>Frequency of Seeking Health</i>			
Seeking Health**	1.18*	0.06	1.00
<i>Perceived Health</i>			
GenHealth	2.41*	0.29	1.03 ³
ADL	0.42*	0.08	0.43
<i>Depression</i>			
CESD1	3.14*	0.24	0.82
CESD2	3.05*	0.22	0.86
CESD3	2.75*	0.18	0.91

Note: $N=184$. The SEs for the factor loadings are the estimates derived by the LISREL8 program,

* $p \leq .05$.

**Seeking Health was specified as a manifest variable.

³ Out of range value

Table 7
Correlations Among the Factors

	Intrinsic	Extrinsic	Religious LOC	Seeking Health	Perceived Health	Depression
Intrinsic	1.00					
Extrinsic	-0.28*	1.00*				
Religious LOC	0.46*	-0.34*	1.00			
Seeking Health	-0.08	0.08	0.08	1.00		
Perceived Health	0.07	-0.18*	-0.23*	-0.35*	1.00	
Depression	-0.23*	0.17*	0.39*	0.24*	-0.53*	1.00

Note. $N = 184$, $*p \leq .05$

orientation were less likely to be depressed than participants low in intrinsic religious orientation.

Extrinsic religious orientation and religious locus of control were significantly related to perceived health and depression. Participants who were high in extrinsic religious orientation were more likely to have poorer perceived health and more likely to have higher depression scores. Participants who were external in religious locus of control were also likely to have poor perceived health and higher rates of depression.

Table 8 presents the explained variance for the endogenous variables. Although the fit of the causal model to the data is fair, an evaluation of the variance explained among the endogenous variables provides more information about the fit of the model. For example, assessing squared multiple correlations (R^2) and examining residuals among the endogenous variables may indicate sources of model misspecification (Raykov & Marcoulides, 2000). The religious variables (intrinsic religious orientation, extrinsic religious orientation, and

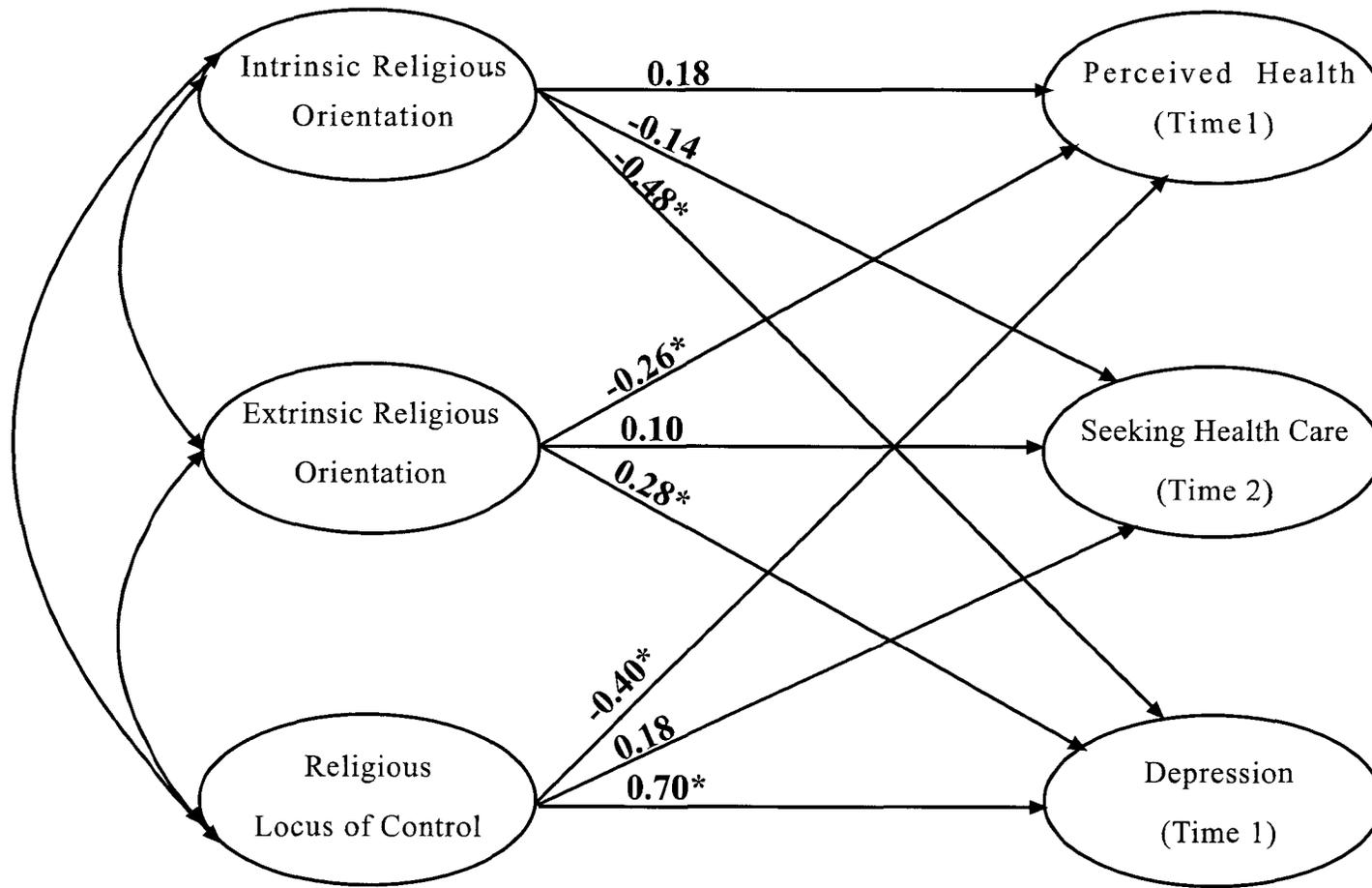


Figure 2. Time 1 Cross-Sectional Causal Model

Table 8
Explained Variance of the Endogenous Variables by the Religious Variables

Dependent Variable	Squared Multiple Correlations	Unexplained Variance
Seeking Health	0.03	0.98
Perceived Health	0.15	0.85
Depression	0.43	0.57

religious locus of control) explain 43% of the variance for depression but only 3% of the variance in the frequency of seeking health care and 15% of the variance in perceived health.

Testing the Longitudinal Model

Participants in the study were asked to complete a second battery of questionnaires approximately 3 months after completing the initial questionnaire. At Time 2, participants were asked to complete the CES-D Depression Scale, the SF-12 Health Survey, and to indicate the frequency with which they sought health care services once again. Table 9 presents descriptive information for the depression and health measures administered at Time 2. Although participants' Time 2 depression and perceived health scores were somewhat lower than at Time 1, they were not significantly different (see Table 9).

The measurement model. Structural equation analysis was also used to test the longitudinal model shown in Figure 3. Specification and testing of the measurement model was similar to the measurement model for the Time 1 cross-sectional analyses. At Time 2, two variables (perceived health and depression) specified as latent variables and a manifest variable (seeking health care) were added to the original cross-sectional model. Multiple indicators for the Time 2 perceived health and depression variables were developed utilizing the same method described for the Time 1 perceived health and depression variables. A

covariance matrix used to test the cross-sectional model along with the two additional variables was used in testing the longitudinal model. Correlations for the perceived health (Time 2), frequency of seeking health care (Time 2) and depression (Time 2) variables added to the correlation matrix are presented in Table 10.

Table 9
Time 2 Health and Depression Measures

	<i>Time 1</i>		<i>Time 2</i>		<i>Change from Time 1</i>	<i>t</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Perceived health	26.02	2.90	25.94	2.90	-0.08	.57
Depression	14.23	9.45	13.34	9.91	-0.90	1.67

Evaluation of the measurement model involved the testing of an 8-factor model with the factors (intrinsic religious orientation, extrinsic religious orientation, religious locus of control, Time 1 perceived health, Time 1 depression, Time 2 perceived health, Time 2 depression, and frequency of seeking health care at Time 2) hypothesized to underlie the measured variables as described above. To evaluate the measurement model the Time 2 depression and perceived health factor loadings were fixed at the values derived for the Time 1 measures, and the model allowed for correlated measurement error between the parallel measures over time. The longitudinal measurement model was found to provide a good fit to the data, $\chi^2(202) = 394.93, p \leq .01$; CFI = .96; SRMSR = .08; RMSEA = .07. As shown in Table 11, the standardized factor loadings of the measured variables on the latent variables ranged from 0.44 to 1.00 and were all highly significant. Table 12 presents the correlations among the longitudinal factors.

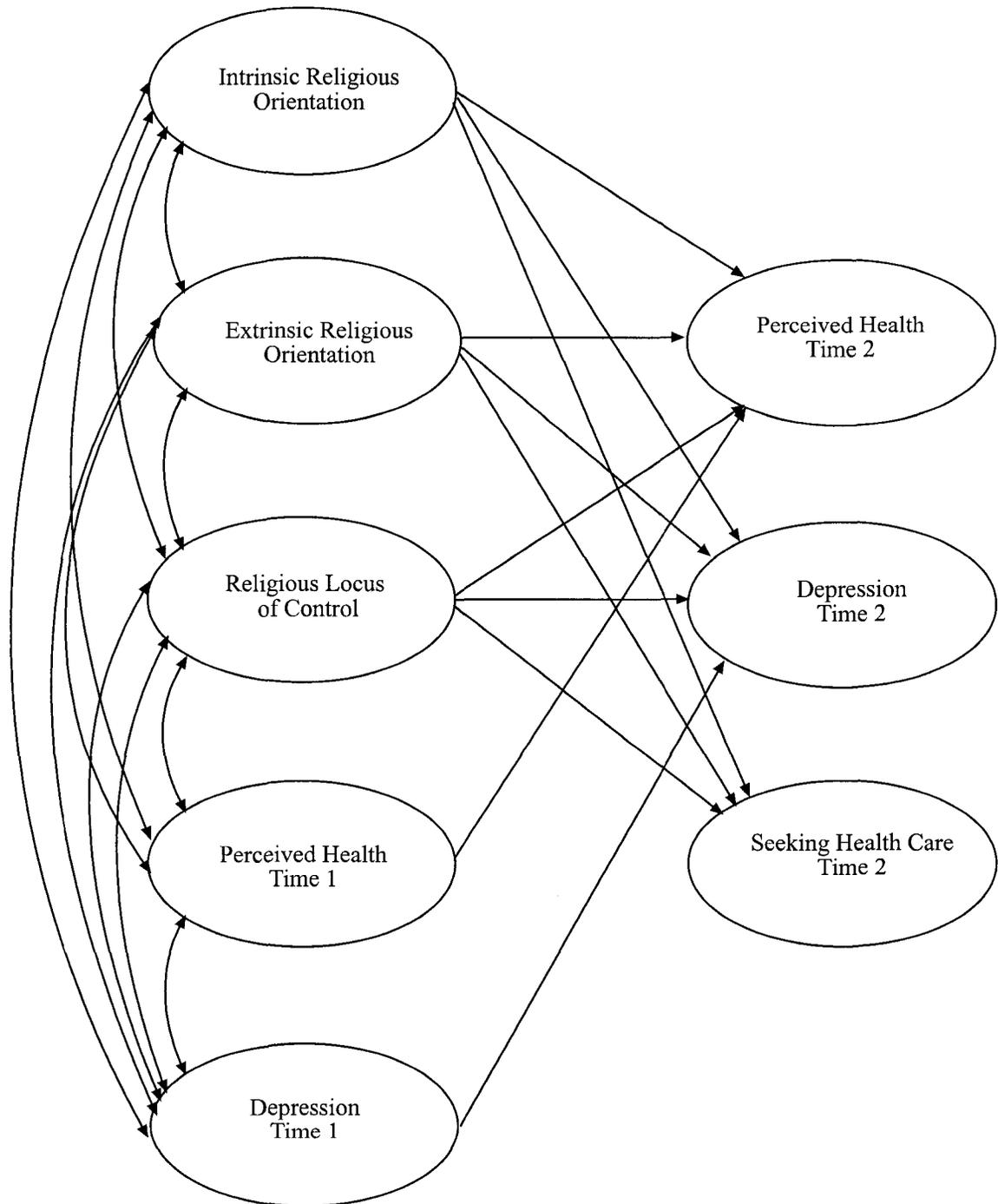


Figure 3. Time 2 Longitudinal Measurement Model

Table 10
Correlations With and Among Variables Added at Time 2

	Intrinsic	Spiritual WB	Meditation	Compassionate	Church	Prayer	Extrinsic1	Extrinsic2	Extrinsic3
Gen Health (T2)	.136	.185*	.145*	.105	.170*	.234**	-.144	-.219**	-.147**
ADL (T2)	-.005	.038	-.055	-.065	.030	.007	-.100	-.037	-.222**
Depression 1 (T2)	-.193**	-.249**	-.189*	-.150*	-.167*	-.196**	.027	.155*	.074
Depression 2 (T2)	-.126	*-.134	-.124	-.100	-.133	-.131	.086	.151*	.129
Depression 3 (T2)	-.181*	-.203**	-.228**	-.151*	-.157*	-.229**	.110	.243**	.117
Seeking Health Care (T2)	-.115	-.087	-.080	-.065	-.048	-.017	.005	-.012	.101

	RLOC1	RLOC2	RLOC3	GenHealth T1	ADL T1	Depress1 T1	Depress2 T1	Depress3 T1
Gen Health (T2)	-.120	-.052	-.100	.694**	-.282**	-.458**	-.443**	-.506**
ADL (T2)	-.083	-.075	-.028	.430**	.549**	-.258**	-.258**	-.235**
Depression 1 (T2)	.205**	.174*	-.002	-.542**	-.120	.701**	.588**	.641**
Depression 2 (T2)	.201**	.150*	.002	-.491**	-.127	.657**	.652**	.642**
Depression 3 (T2)	.149*	.137	-.006	.524**	-.117	.627**	.595**	.696**
Seeking Health Care (T2)	.076	.005	.067	-.358**	-.210**	-.199**	.223**	.200**

	GenHealth T2	ADL T2	Depress1 T2	Depress2 T2	Depress3 T2	Seeking Health Care T2
Gen Health (T2)	2.318					
ADL (T2)	.398**	1.053				
Depression 1 (T2)	-.627**	-.276**	3.789			
Depression 2 (T2)	-.572**	-.277**	.807**	3.615		
Depression 3 (T2)	-.634**	-.307**	.798**	.818**	3.180	
Seeking Health Care (T2)	-.286**	-.281**	.191**	.230**	.174**	1.18

Note: $n = 184$, ** $p \leq .01$, * $p \leq .05$. Standard Deviations of the measures are reported in the shaded boxes along the diagonal of the matrix.

Table 11
Factor Loading for Time 2 Variables

Variables	Unstandardized Factor Loading	Standard Error (SE)	Standardized Factor Loading
<i>Intrinsic Religious Orientation</i>			
Intrinsic	1.00	---	0.88
Spiritual Well-Being	1.52*	0.09	0.90
Meditation/Improvement	0.82*	0.05	0.87
Compassionate Petition	1.31*	0.08	0.89
Church Attendance	0.22*	0.02	0.77
Prayer (frequency of)	0.24*	0.01	0.86
<i>Extrinsic Religious Orientation</i>			
Extrinsic1	1.00	---	0.55
Extrinsic2	1.24*	0.21	0.67
Extrinsic3	1.32*	0.23	0.82
<i>Religious Locus of Control</i>			
RLOC1	1.00	---	0.57
RLOC2	1.00*	0.19	0.60
RLOC3	0.68*	0.14	0.50
<i>Frequency of Seeking Health</i>			
Seeking Health Care **	1.00	---	1.00
<i>Perceived Health (Time 1)</i>			
GenHealth (T1)	1.00	---	1.00
ADL (T1)	0.20*	0.03	0.48
<i>Depression (Time1)</i>			
CESD1 (T1)	1.00	---	0.83
CESD2 (T1)	0.97*	0.05	0.86
CESD3 (T1)	0.87*	0.04	0.91
<i>Perceived Health (Time 2)</i>			
GenHealth (T2)	1.00	---	0.89
ADL (T2)	0.20*	0.03	0.41
<i>Depression (Time 2)</i>			
CESD1 (T2)	1.00	---	0.89
CESD2 (T2)	0.97*	0.05	0.90
CESD3 (T2)	0.87*	0.04	0.91

Note: $N=184$. The SEs for the factor loadings are the estimates derived by the LISREL8 program,

* $p \leq .05$

**Seeking Health Care specified as a manifest variable.

Table 12
Correlations Among Study 2 Factors

	Intrinsic	Extrinsic	Religious LOC	Seeking Health	Perceived Health (T1)	Perceived Health (T2)	Depression (T1)	Depression (T2)
Intrinsic	1.00							
Extrinsic	-0.29*	1.00						
Religious LOC	0.46*	-0.33*	1.00					
Seeking Health (T2)	-0.08	0.07	0.08	1.00				
Perceived Health (T1)	0.06	-0.18*	-0.24*	-0.35*	1.00			
Perceived Health (T2)	0.21*	-0.26*	-0.18	-0.34*	0.87*	1.00		
Depression (T1)	-0.23*	0.18	0.39*	0.24*	-0.54*	-0.54*	1.00	
Depression (T2)	-0.22*	0.19*	0.24*	0.22*	-0.58*	-0.77*	0.80*	1.00

Note. $N = 184$, $*p \leq .05$

None of the religious variables (intrinsic religious orientation, extrinsic religious orientation, and religious locus of control) were related to the frequency with which participants indicated they sought health care services at Time 2. Intrinsic religious orientation was unrelated to perceived health at Time 1 but was significantly related to perceived health at Time 2. Intrinsic religious orientation was also negatively related to depression at Times 1 and 2. Extrinsic religious orientation was negatively related to health at both Time 1 and Time 2, and positively related to depression at Time 2. Religious locus of control was positively related to depression at Times 1 and 2. Finally, religious locus of control was negatively related to health at Time 1 but was unrelated to health at Time 2.

Time 2 Longitudinal Causal Model. Specification of the variables in the measurement model appeared adequate; therefore, the longitudinal causal model shown in Figure 3 was tested. The standardized path coefficients from this model are presented in Figure 4. After controlling for the influence of Time 1 perceived health and depression measures, intrinsic religious orientation was found to be negatively related to the frequency with which participants sought health care services. It was also positively related to participants' perceived health at Time 2. Participants who had higher levels of intrinsic religious orientation were more likely to have good perceived health than participants who were lower in intrinsic religious orientation. Participants high in intrinsic religious orientation were also less likely to be depressed at Time 2 than participants low in intrinsic religious orientation.

Extrinsic religious orientation was also related to the frequency with which participants saw a health care provider. Participants high in extrinsic religious orientation were more likely to go to a health care provider than participants low in extrinsic religious

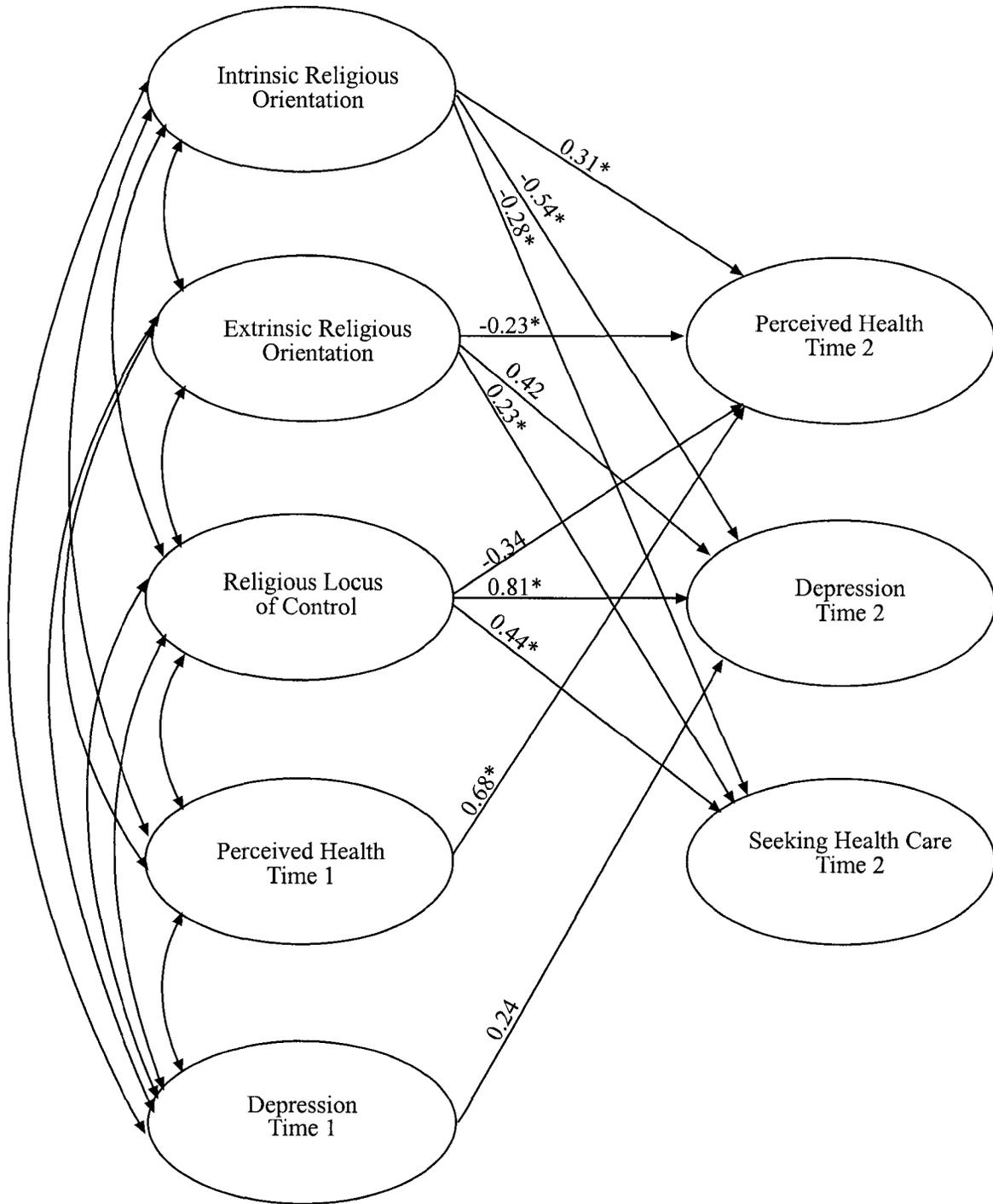


Figure 4. Time 2 Longitudinal Causal Model

orientation. Extrinsic religious orientation was unrelated to perceived health or depression at Time 2 net of the relationship with the Time 1 measures.

Religious locus of control was also related to the frequency of seeking health care services at Time 2. Participants with an external religious locus of control were more likely to visit a health care provider than participants with an internal religious locus of control. Participants with an external religious locus of control were also more likely to be depressed at Time 2 than participants with an internal religious locus of control. Religious locus of control was unrelated to perceived health status at Time 2 after controlling for the influence of Time 1 depression.

Table 13
Time 2: Explained Variance of Dependent Measures by Religious Variances

Dependent Variable	Squared Multiple Correlations	Unexplained Variance
Seeking Health Care	0.11	0.89
Perceived Health (Time 2)	0.81	0.19
Depression (Time 2)	0.69	0.31

The explained variance for the Time 2 dependent measures are presented in Table 13. The religious variables (intrinsic religious orientation, extrinsic religious orientation, and religious locus of control) explain 81% of the variance in Time 2 perceived health, 65% of the variance of Time 2 depression, and only 11% of the variance in the frequency of seeking health care.

Testing for Gender Differences

Time 1. Two measurement models were analyzed to determine whether the factor loadings for the religious variables, perceived health, seeking health care, and depression varied for men and women. The first measurement model allowed the factor loadings to be different men and women; the fit of this “free” model was $\chi^2(242) = 471.72$. For the second measurement model, the factor loadings were forced to be identical for men and women; the fit of this “constrained” model was $\chi^2(256) = 492.27$. The fit of these two models were not significantly different, $\chi^2(14) = 20.55$, indicating that the factor loadings did not vary significantly for men and women.

Based on these results, the cross-sectional causal model was tested to determine whether the causal paths varied for men and women. The first model allowed the causal paths to be different for the two sexes; the fit of this model was $\chi^2(254) = 488.72$. In the second model, the causal paths were forced to be identical for men and women; the fit of this model was $\chi^2(263) = 506.81$. The fit of these two models was significantly different, $\chi^2(9) = 18.09, p \leq .05$. An examination of the modification indices indicated that the causal path between intrinsic religious orientation and depression at Time 1 was significantly different for men and women. A third causal model was tested allowing this path to be different for men and women; the fit of this model was $\chi^2(262) = 497.04$. The fit of this third model did not differ significantly from the fit of the first (free) model, $\chi^2(8) = 8.32$. From this model, extrinsic religious orientation was found to be negatively related to frequency of seeking health care for men ($\beta = -.42$), but not significantly related for women ($\beta = .16$).

Time 2. Analysis of the Time 2 data was similar to the analyses conducted on the Time 1 data. Two measurement models were tested to determine whether the factor structure for the religious variables and the Time 1 and Time 2 variables (perceived health, seeking health care, and depression) varied for men and women. The first measurement model allowed the factor loadings to vary for men and women; the fit of this model was $\chi^2(402) = 692.48$.⁴ In the second measurement model the factor loadings were fixed for the two sexes; the fit of this model was $\chi^2(414) = 704.97$. The fit of these two models were not significantly different, $\chi^2(12) = 12.49$.

Once again two causal models were tested where the causal paths were allowed to vary for men and women ($\chi^2(422) = 729.45$) and where causal paths were forced to be equal ($\chi^2(439) = 748.06$). The fit of these models were not significantly different from each other, $\chi^2(17) = 18.61$, indicating that the causal paths were the same for men and women.

⁴ The longitudinal models testing for gender differences had an out of range value for the error variance of the general health variable for men. Attempts to control this error term by setting it to zero resulted in an error message indicating that the covariance matrix was not positive definite. We believe that this out-of-range value occurred because of the small sample size for men ($n=54$). Although it appears unlikely that this out-of-range value greatly affected the results, this problem should be noted.

CHAPTER 5. DISCUSSION

This study was designed to explore the relationships between religious involvement and health and well-being utilizing multiple measures of religious involvement at two time points. The results of this study indicate that dimensions of religious involvement (i.e., intrinsic religious orientation, extrinsic religious orientation, and religious locus of control) serve as important predictors of depression, perceived health, and the frequency of seeking health care services. This investigation examined the effects of religious involvement on these variables, utilizing a structural equation analysis approach, and also tested for gender differences in these relationships.

The extent to which individuals live their religion and incorporate their beliefs into their daily lives (termed intrinsic religious involvement) was found to be an important predictor of depression, perceived health, and frequency of seeking health care services. At Times 1 and 2, this variable was negatively related to depression and positively related to perceived health. It was also negatively related to the frequency of seeking health care services. These findings suggest that intrinsic religious orientation may provide some protection against depression and illness.

A construct representing intrinsic religious orientation was operationalized by creating a latent variable model consisting of the measured variables of spiritual well-being, compassionate petition structure of prayer subscale, mediation-improvement structure of prayer subscale, frequency of church attendance, frequency of prayer, and the dimension of intrinsic religious orientation (as measured by Allport & Ross, 1967). A variety of mechanisms may explain the relationship between intrinsic religious orientation, depression, health, and well-being. These include (a) intrinsic religious orientation as a coping

mechanism, (b) intrinsic religious orientation and a positive outlook on life, or (c) intrinsic religious orientation and its role in relationships.

Stressful events have been found to have negative consequences on both mental (e.g., depression, anxiety) and physical health (e.g., coronary heart disease; Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002). Intrinsic religious orientation may provide individuals with the ability to cope with stress, and thereby enhance their ability to deal with challenging life events. A quote from the Bible states, "He alone is my rock and my salvation; he is my fortress, I will never be shaken." (Psalms 62:2). The belief that God has a reason for certain aversive events or the belief that God does not subject individuals to more than what can be tolerated may lead to the perception that the aversive effect is not too stressful. An alternative view of coping is the belief that the outcome of the aversive event is in God's hands. It allows an individual to release or let go of any possible burdens associated with these events (i.e., the weight is lifted from their shoulders).

Religious involvement is associated with life satisfaction (Hong & Giannakopoulos, 1994; Martin Combs & Bayne Smith, 2000; Neto, 1995; Pfeifer & Waelty, 1995) and happiness (Clark et al., 1999). Scheier and Carver (2003) found that people with an optimistic outlook reacted with less distress when faced with health problems than people with a pessimistic outlook. Intrinsic religious orientation may provide a positive framework from which to approach life and add a sense significance or purpose to people's lives. In addition, the feeling that one is loved by God may serve to promote a positive perception of self, an important component of mental health.

Intrinsic religious orientation may influence depression, health, and well-being through its role in relationships with God and other people. In particular, social support and

social networks may provide a mechanism through which an intrinsic religious orientation confers its benefits. Individuals high in intrinsic religious orientation are more likely to attend church and take part in church activities, providing the opportunity to develop and maintain close relationships with others who share similar beliefs. Consequently, perceived social support may be derived from relationships developed at church.

Intrinsic religious orientation may also confer positive benefits through an individual's personal relationship with God. For example, prayer (one of the indicators of an intrinsic religious orientation) may provide an opportunity for individuals to disclose feelings and thoughts about their lives that they find stressful. It is also an opportunity for individuals to ask for guidance, assistance for themselves or others, forgiveness, to give thanks, or to demonstrate admiration to a supreme being. According to a Gallup Poll conducted in 1993 among Americans who pray, 53% report that prayers are most often conversational, 15% use prayers for meditative or reflective reasons, 13% use formal prayers (e.g., reciting the Lord's Prayer), and 14% use a combination of all three (Gallup Jr., 1999).

Intrinsic religious orientation may also afford some comfort and support in the belief that God or a Supreme Being is listening and possibly responding (Hood, Spilka, Hunsberger, & Gorsuch, 1996). The majority of individuals who pray believe their prayers have been heard (97%) and that their prayers have been answered (95%; Gallup Jr., 1999). Praying also results in good feelings; 86% of individuals who pray believe their prayers make them better people and 77% are satisfied with their prayer life (Gallup Jr., 1999). This effect may be similar to one of six social support provisions afforded by social relationships termed attachment, which is a sense of emotional closeness and security (Cutrona, 1986).

Personal communication with God may also provide beneficial effects to health and well-being through disclosure of traumatic events and experiences. For example, research by Pennebaker and his colleagues suggests that disclosing traumatic experiences or events either through writing or talking reduces the negative effects of inhibition (i.e., pent up thoughts, feelings; Pennebaker, 1988). Expression of pent-up thoughts and emotions associated with aversive events leads to improved physical health, enhanced immune function, and reductions in the number of visits to a health care provider (Berry, 1993).

Participants who endorsed religious beliefs in order to gain some form of social advantage, social approval, or benefit (termed extrinsic religious orientation) were more likely to be depressed and have poorer perceived health at Time 1. At Time 2, extrinsic religious orientation was predictive of the frequency of seeking health care services and perceived health. Previous research examining the effects of extrinsic religious orientation have found that extrinsic religious orientation is related to depression (Genia, 1998; Maltby & Day, 2000; Park, Murgatroyd, Raynock, & Spillett, 1998; Watson et al., 1988a,b; 1989).. However, extrinsic religious orientation was not related to depression at Time 2 net of Time 1 depression. The finding that this dimension of religiosity is related to poorer perceived health and frequency of seeking health care is new.

The relationship between extrinsic religious orientation, depression, perceived health and frequency of seeking health care services may reflect individuals who use religion solely as a means by which to cope with depression and poor health. That is, individuals with an extrinsic religious orientation may only seek God when challenged by aversive events. It is similar to the notion that there are “no atheists in foxholes,” suggesting that even individuals who don’t believe in God turn to Him (or Her) when they are faced with their own mortality.

Bjorck (1997) posits that the use of religion in this manner (i.e., purely utilitarian) may be a maladaptive strategy. Rather than help the individual, it may preclude alternative coping strategies (i.e., seeking health care services, taking an active role in healing and recovery).

Participants who believe that outcomes are under the control of powerful others (i.e., God) or determined by spiritual intervention were more likely to be depressed, have poorer perceived health, and more likely to seek health care services than participants with an internal religious locus of control. This finding is consistent with research examining the role of locus of control in health-related behaviors more generally (Kidwell & Blair, 2003). That is, individuals with an internal locus of control are more likely to believe that they can influence their health outcomes. However, religious locus of control was positively correlated with intrinsic religious orientation ($r = .46, p \leq .05$) and negatively related to extrinsic religious orientation ($r = -.34, p \leq .05$). The positive relationship between religious locus of control and intrinsic religious orientation presents an interesting dilemma. Whereas both of these variables exert an influence on depression, perceived health, and frequency of seeking health care services, the variables exert influence in opposite directions. This association is difficult to explain.

The relationship between intrinsic religious orientation and external locus of control may be explained by examining the level of intrinsic religious orientation relative to the level of external religious locus of control. For example, although high intrinsic religious orientation may provide benefits in health and well-being, it is possible that individuals with the highest levels of intrinsic religious orientation may be the most external in their locus of control. An alternative explanation may be related to whether individuals high in intrinsic religious orientation believe that God has a plan for them or whether they believe that God

gives them free choice in making decisions and choosing their paths in life. Individuals who believe that God has given them free choice in making decisions may be more likely to believe that they have control over their fate and therefore have the ability to choose to seek health care or to engage in behaviors that promote health (e.g., taking medications). By contrast, individuals who believe that their lives are determined by God may be more likely to accept their fate as God's will and not seek health care services or engage in behavior that promotes health. Careful examination of the religious locus of control measure reveals some ambiguity as to what is being measured. That is, of the 23 items, only 6 items specifically include wording reflecting God, spirituality, or the supernatural. It appears that the religious locus of control scale measures locus of control in general rather than a specific religious locus of control. We would probably find similar results had we used a general measure of locus of control.

Church attendance, participation in church activities, and saying prayers may reflect an individual's commitment to religious beliefs. People with stronger religious beliefs/attitudes are more likely to engage and participate in public and private religious activities than people with weak or no religious beliefs/attitudes. However, the frequency of church attendance may be a function of health status. As health declines, church attendance may also decline. Therefore, the influence of church attendance on health and well-being may reflect a spurious effect. That is, poor health may interfere with an individual's ability to go to church, rather than church attendance positively influencing health. If church attendance is beneficial to health, we would expect to find a significant relationship between the two after controlling for the influence of initial health status. If the relationship between church attendance and health is spurious then we would not expect to find a positive

relationship between the two after controlling for the influence of initial health status. An important question for future research then is, “Why did frequency of church attendance decrease?” Reasons for decreasing attendance may reflect disillusionment with the church, impaired health, or conflicting obligations (e.g., work, family, school).

Previous research indicates that benefits derived from religious involvement are greater for women than men. McCullough (2000) suggests that this may be due to psychosocial resources received through religious involvement (e.g., social support). The majority of the participants in the current study were women. The small sample size for men was a challenge in making comparisons between men and women. The results of this investigation are not entirely consistent with findings of previous research. At Time 1, extrinsic religious orientation was negatively related to the frequency of seeking health care services for men (i.e., they were less likely to seek care) but not for women. Unlike previous studies, the effect of intrinsic religious orientation was not found to be different between men and women.

In general, men and women who participated in the study were more depressed at Times 1 and 2 ($M=14.23$ at Time 1, $M=13.39$ at Time 2) than individuals in the reference groups ($M=8.5$). Radloff (1976) suggests using a score of 16 as a cutoff for clinical depression on the CES-D scale. Although the mean depression score among participants was less than the clinical cutoff, it was considerably higher than for the reference group. A possible explanation may be that approximately one-third (37%) of the participants in this study were first year students, with data collected during their first semester in college. It is important to note that the initial wave of data collection took place at the beginning of the semester, when students were in the process of becoming acclimated to life in college. The

second wave of data collection took place approximately 1-2 weeks prior to final exams, when depression among participants was lower. Although participants in the study had a higher level of depression than individuals in the reference groups, the finding that religious involvement (e.g., intrinsic religious orientation) is inversely related to depression is consistent with previous research (Nelson, 1989a, b, 1990; Watson, Morris, & Hood, 1988a; b).

The majority of participants were single white college students recruited from three Midwestern universities. It is possible that participants who were high in religious involvement may not be similar to highly religious individuals in other parts of the United States (e.g., southern states, a region characterized by fundamentalists, people who strictly adhere to their religious beliefs). Generalizing these results to other ethnic and racial groups may also be problematic. More diverse samples (e.g., older, different racial/ethnic groups, lower SES) may provide a better understanding of the relationship between religious involvement, health, and well-being.

There are also other limitations of this study that should be noted. First, the possibility of a self-selection bias exists for the Time 2 participants. Although participants who dropped out of the study after Time 1 were not statistically different from participants who continued onto Time 2, the possibility remains that participants who dropped out after Time 1 did so because they were dissuaded by the number of items assessing religious involvement. In contrast, participants high in religious involvement may have been more interested in the study due to the large number of religious items. Another issue involves the use of self-report measures to assess religious involvement, depression, health, and frequency of seeking health. Although self-report information provides valuable information,

verification utilizing alternative methods of data collection (e.g., medical records) may help to validate participants' responses. A third issue involves the type of analyses (i.e., structural equation modeling) utilized in the study. Analyses were based on the assumption of multivariate normality. The distributions of the measures showed some kurtosis that would indicate violation of multivariate normality. This may affect the results.

This study suggests that religious involvement is predictive of depression, perceived health, and the frequency of seeking health care service both directly or indirectly through initial levels of depression and health. The participants in this study were young and were not likely to have serious health problems. In addition, the period between Time 1 and Time 2 was relatively short (i.e., 3 months) and may not have been sufficiently long to capture the true effects of religious involvement on health. Longitudinal studies involving an elderly sample may provide a richer source of information regarding the effects of religious involvement on health and well-being.

Stress, negative emotions (e.g., depression, anxiety, anger, and hostility), and the quality of personal relationships (e.g., loneliness) have been associated with immune functioning (Padgett & Glasser, 2003; Kiecolt-Glaser, 1999; Kiecolt-Glaser et al., 2002). Religious involvement may provide a buffer from these negative emotions and stress by reducing the potential influence on the immune system (Koenig, Cohen, George, Hays, Larson, Blazer, 1997; Seeman, Dubin, & Seeman, 2003; Woods, Antoni, Ironson, & Kling, 1999). Stress and negative emotions are also thought to have other physiological consequences on health through reactivity (e.g., heart disease). Religious involvement may be beneficial by reducing the amount of reactivity experienced. Additional immune system testing (e.g., measurement of T-cells) is required to determine whether the immune system is affected by religious involvement and,

more importantly, determining whether religious involvement affects immune system functioning over time. Utilization of other indicators of health status would be appropriate in determining whether religious involvement confers physical benefits.

Religious attendance has also been found to influence physiological functioning. For example, among an elderly midwest sample, individuals who attended religious services more frequently were more likely to have IL-6 (a marker for cardiovascular disease) levels below the 3.19 pg/mL cutoff associated with mortality rates (Lutgendorf, Russell, Ullrich, Harris, & Wallace, in press). This relationship remained significant after controlling for potential confounding variables, such as age, sex, body mass index, physical illness, C reactive protein, physical illness, social network size, depression, and history of cardiovascular disease.

Religious involvement may have important preventive as well as healing effects on health and well-being. Understanding this process may have important utility in the formation of treatment plans and the development of health care policies. Incorporation of religious beliefs in their lives may serve to enhance the health and well-being of individuals by decreasing health-debilitating behaviors such as smoking, use of drugs and alcohol, or not getting adequate sleep. Religious beliefs may decrease health-debilitating behaviors through two possible routes. First, smoking, drinking alcohol, or the use of drugs may be proscribed by the religion, thereby decreasing the likelihood of engaging in these activities. An alternative route may be through the influence of religious involvement on psychological states. For example, individuals who are stressed or depressed are more likely to engage in behaviors demonstrated to be harmful (e.g., drug and alcohol use, poor sleep habits, poor nutrition; Kiecolt-Glaser et al., 2002). Therefore, if religious involvement affects these

psychological states, then we would not expect individuals high in religious involvement to engage in these debilitating behaviors.

The perception that God has a plan and comfort derived from religious beliefs may also serve to enhance self-esteem, positive affect, and promote health-enhancing behaviors such as exercise or eating healthily. Religious beliefs may bolster self-esteem by increasing the sense of being loved (Krause, 1995). A study involving a large sample of college students from 31 countries found that self-esteem was positively correlated with happiness and life satisfaction (Diener and Diener, 1995). Religious involvement may indirectly influence health through its effects on self-esteem. Positive affect and feelings of contentment may also be strengthened by the belief that one is loved and cared for. These states or feelings have been found to be associated with good health, although the mechanism is not clear (Pettit, Kline, Gencoz, Gencoz, & Joiner, 2001).

An important focus of future studies should be to determine the process by which religious involvement is linked to health and well-being, rather than simply verifying that a relationship exists. In particular, future studies examining this topic should involve the application of social psychological theories. For example, a basic assumption of attribution theory is that we are all “naïve scientists” trying to find explanations for the behavior of others and for events that occur to us. Therefore, we are motivated to understand, predict, and control events in our lives. Religion may be one means by which individuals attempt to understand and make sense of the world around them and by which individuals may exert control in their lives (e.g., asking for assistance for themselves or others, giving thanks). What type of religious attributions do individuals make when something bad happens to them? Some individuals may believe that God is “testing” them whereas others may believe

that God is punishing them is a consequence for something they have done. Negative effects experienced from harmful events may be magnified among individuals who believe that these harmful events are punishment from God.

APPENDIX. SURVEY INSTRUMENTS

SF-12 Health Survey

Instructions: this questionnaire asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities. Please answer every question by marking one box. If you are unsure about how to answer, please give the best answer you can.

*1. In general, would you say your health is...

Excellent	Very Good	Good	Fair	Poor
A	B	C	D	E

The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

	Yes, Limited A Lot	Yes, Limited A Little	No, Not Limited At All
*2. Moderate activities , such as moving a table, pushing a vacuum cleaner, bowling, or playing golf.	A	B	C
*3. Climbing several flights of stairs	A	B	C

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

	YES	NO
*4. Accomplished less than you would like	A	B
*5. Were limited in the kind of work or other activities	A	B

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

	YES	NO
6. Accomplished less than you would like	A	B
7. Didn't do work or other activities as carefully as usual	A	B

SF-12 Health Survey (continued)

*8. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

Not at all **A little bit** **Moderately** **Quite a bit** **Extremely**
A **B** **C** **D** **E**

These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one that comes closest to the way you have been feeling. How much of the time during the past 4 weeks

	All of the Time	Most of the Time	A Good Bit of the Time	Some of the Time	A Little of the Time	None of the Time
9. Have you felt calm and peaceful?	A	B	C	D	E	F
*10. Did you have a lot of energy?	A	B	C	D	E	F
11. Have you felt downhearted and blue?	A	B	C	D	E	F

*12. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?

All of the time **Most of the time** **Some of the time** **A little of the time** **None of the time**
A **B** **C** **D** **E**

Seeking Health Care Services

13. In the past 6 months, how often have you gone to a health care provider (e.g., physician, nurse practitioner) with a non-injury related illness? (Choose one)

A	B	C	D	E	F	G	H	I	J
None	Once	Twice	3x	4x	5x	6x	7x	8x	More than 9 times

CES-Depression Scale

Please rate how frequently you experience the following situations using the scale below:

A	B	C	D
Rarely or None of the Time	Some of the Time	Much of the Time	Most of the Time

1. I was bothered by things that don't usually bother me.
2. I did not feel like eating. My appetite was poor.
3. I felt that I could not shake off the blues even with help from my family and friends.
4. I felt that I was just as good as other people.
5. I had trouble keeping my mind on what I was doing.
6. I felt depressed.
7. I felt that everything I did was an effort.
8. I felt hopeful about the future.
9. I thought my life had been a failure.
10. I felt fearful.
11. My sleep was restless.
12. I was happy.
13. It seemed that I talked less than usual.
14. I felt lonely.
15. People were unfriendly.
16. I enjoyed life.
17. I had crying spells.
18. I felt sad.
19. I felt that people disliked me.
20. I could not get going.

Religious Orientation Scale

Please indicate the extent to which you agree or disagree with each item below by using the following rating scale.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

- *1. Although I believe in my religion, I feel there are many more important things in my life.
- *2. It doesn't matter so much what I believe so long as I lead a moral life.
- 3. It is important for me to spend periods of time in private religious thought and mediation.
- *4. The primary purpose of prayer is to gain relief and protection.
- 5. If not prevented by unavoidable circumstances, I attend church.
- 6. I try hard to carry my religion over into all my other dealings in life.
- *7. The church is most important as a place to formulate good social relationships.
- *8. What religion offers me most is comfort when sorrows and misfortune strike.
- *9. I pray chiefly because I have been taught to pray.
- 10. The prayers I say when I am alone carry as much meaning and personal emotion as those said by me during services.
- 11. Quite often I have been keenly aware of the presence of God or the Divine Being.
- 12. I read literature about my faith (or church).
- *13. Although I am a religious person I refuse to let religious considerations influence my everyday affairs.
- 14. If I were to join a church group I would prefer to join a Bible study group rather than a social fellowship.
- *15. A primary reason for my interest in religion is that my church is a congenial social activity.
- 16. My religious beliefs are really what lie behind my whole approach to life.
- *17. Occasionally I find it necessary to compromise my religious beliefs in order to protect my social and economic well-being.
- 18. Religion is especially important because it answers many questions about the meaning of life.

Religious Orientation Scale (continued)

Please indicate the extent to which you agree or disagree with each item below by using the following rating scale.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

*19. One reason for my being a church member is that such membership helps to establish a person in the community.

*20. The purpose of prayer is to secure a happy and peaceful life.

*Note: *Extrinsic religious orientation items.*

Structure of Prayer Scale

Please indicate the extent with which you agree with each of the following statements. Please use the scale below.

1	2	3	4	5	6
Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

1. When I pray alone, I have a ritual that I adhere to strictly.
2. Through deep prayer I am able to know God better.
3. It is important to me to tell God about my sins or faults.
4. When I pray, I want to share my life with God.
5. I usually pray for God to make me a better person.
6. I pray to give thanks for all God has done for me.
7. When I feel guilty about something, it helps to tell God about it.
8. When God has answered my prayers, I usually give thanks.
9. My prayers are like rituals; they have a regular, orderly sequence.
10. I usually say a prayer before each meal.
11. I like to say prayers for people about whom I care very much.
12. I always pray before I go to sleep.

Structure of Prayer Scale

Please indicate the extent with which you agree with each of the following statements. Please use the scale below.

1	2	3	4	5	6
Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree

13. I must admit that I usually pray to get something.
14. Confession is important to me because it helps me lead a more respectable life.
15. When I pray, I ask God for special favors.
16. Prayer helps me keep my life balanced and happy.
17. When I pray, I confess to God the things I should not have done.
18. Usually when I feel unable to help my loved ones, I ask God for help.
19. I ask God to help others when I am unable to.
20. When I pray, I have certain words or phrases that I repeat a number of times.
21. In my prayers I like to express my recognition for what God grants me.
22. Most of my prayers are for God to solve problems.
23. When I finish praying, I feel like a better person.
24. I pray for other people.
25. A morning prayer helps me cope with the world during the day.
26. Prayer is a way for me to connect with my inner spirit.
27. When I pray, I feel secure.
28. I pray daily.

Structure of Prayer Subscales:

Confession	(5 items)	3, 4, 7, 14, 17
Petition	(3 items)	13, 15, 22
Ritual	(3 items)	1, 9, 20
Meditation-Improvement	(5 items)	2, 16, 23, 26, 27
Habit	(4 items)	10, 12, 25, 28
Compassionate Petition	(8 items)	5, 6, 8, 11, 18, 19, 21, 24

Spiritual Well Being Scale

Using the scale below, please indicate the extent to which you agree or disagree with each of the following statements:

1	2	3	4	5	6
Strongly Disagree	Moderately Disagree	Disagree	Agree	Moderately Agree	Strongly Agree

- *1. I don't find much satisfaction in private prayer with God.
- *2. I don't know who I am, where I came from, or where I'm going.
- 3. I believe that God loves me and cares about me.
- 4. I feel that life is a positive experience.
- *5. I believe that God is impersonal and not interested in my daily situations.
- *6. I feel unsettled about my future.
- 7. I have a personally meaningful relationship with God.
- 8. I feel very fulfilled and satisfied with life.
- *9. I don't get much personal strength and support from my God.
- 10. I feel a sense of well-being about the direction my life is headed in.
- 11. I believe that God is concerned about my problems.
- *12. I don't enjoy much about life.
- *13. I don't have a personally satisfying relationship with God.
- 14. I feel good about my future.
- 15. My relationship with God helps me not to feel lonely.
- *16. I feel that life is full of conflict and unhappiness.
- 17. I feel most fulfilled when I'm in close communion with God.
- *18. Life doesn't have much meaning.
- 19. My relation with God contributes to my sense of well-being.
- 20. I believe there is some real purpose for my life.

Note: **Reversed scored items. Odd number items assess religious well-being, even numbered items assess existential well-being.*

Religious Locus of Control Scale

In the following section, please select the item with which you more strongly agree.

1. a. Children get into trouble because their parents punish them too much.
b. The trouble with most children nowadays is that their parents are too easy with them.
- *2. a. Many of the unhappy things in people's lives are partly due to forces of spiritual powers.
b. People's misfortunes result from mistakes they make.
- **3. a. One of the major reasons why we have wars is because people try to prevent them.
b. There will always be wars, no matter how hard people try to prevent them.
- **4. a. In the long run people get the respect they deserve in this world.
b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.
- **5. a. The idea that teachers are unfair to students is nonsense.
b. Most students don't realize the extent to which their grades are influenced by accidental happenings.
- *6. a. Without God's help, one cannot be an effective leader.
b. Capable people who fail to become leaders have not taken advantage of their opportunities.
- *7. a. No matter how hard you try, some people just don't like you.
b. People who can't get others to like them don't understand how to get along with others.
8. a. Heredity plays a major role in determining one's personality.
b. It is one's experiences in life, which determine what one is like.
- *9. a. I have often found that what is going to happen will happen.
b. Trusting to spiritual assistance has never turned out as well for me as making a decision to take a definite course of action.
- **10. a. In the case of the well-prepared student there is rarely if ever such a thing as an unfair test.
b. Many times exam questions tend to be so unrelated to course work that studying is really useless.
- **11. a. Becoming a success is a matter of hard work; no other powerful forces are at work.
b. Getting a good job depends mainly on being in the right place at the right time.
- **12. a. The average citizen can have an influence in government decisions.
b. This world is run by the few people in power, and there is not much the little guy can do about it.
- **13. a. When I make plans, I am almost certain that I can make them work.
b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.

Religious Locus of Control Scale

In the following section, please select the item with which you more strongly agree.

- 14. a. There are certain people who are just no good.
b. There is some good in everybody.
- **15. a. In my case getting what I want has little or nothing to do with spiritual guidance.
b. Many times we might just as well decide what to do by relying on powerful others.
- *16. a. Who gets to be the boss often depends on who was fortunate enough or was chosen to be in the right place first.
b. Getting people to do the right thing depends on ability; powerful spiritual forces have little or nothing to do with it.
- *17. a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand nor control.
b. By taking an active part in political and social affairs, people can control world events.
- *18. a. Most people can't realize the extent to which their lives are controlled by the supernatural happenings which man can't understand.
b. There really is no such thing as providence or fortune.
- 19. a. One should always be willing to admit mistakes.
b. It is usually best to cover up one's mistakes.
- *20. a. It is hard to know whether or not a person really likes you.
b. How many friends you have depends on how nice a person you are.
- *21. a. In the long run the bad things that happen to us are balanced by the good ones.
b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.
- **22. a. With enough effort we can wipe out political corruption.
b. It is difficult for people to have much control over the things politicians do in office.
- *23. a. Sometimes I can't understand how teachers arrive at the grades they give.
b. There is a direct connection between how hard I study and the grades I get.
- 24. a. A good leader expects people to decide for themselves what they should do.
b. A good leader makes it clear to everybody what their jobs are.
- *25. a. Many times I feel that I have little influence over the things that happen to me.
b. It is impossible for me to believe that supernatural or spiritual forces play an important role in my life.
- **26. a. People are lonely because they don't try to be friendly.
b. There's not much use in trying too hard to please people: if they like you, they like you.
- 27. a. There is too much emphasis on athletics in high school.
b. There's not much emphasis on athletics in high school.

Religious Locus of Control Scale

In the following section, please select the item with which you more strongly agree.

- **28. a. What happens to me is my own doing.
b. Sometimes I feel that I don't have enough control over the direction my life is taking.
- *29. a. Most of the time I can't understand why politicians behave the way they do.
b. In the long run the people are responsible for bad government on a national as well as on a local level.

Note: * *a* responses are scored 1
** *b* responses are scored 1

Private and Public Religious Behavior

30. How often do you attend religious services? (Choose one)

A	B	C	D	E	F	G
Never	1-5 times per year	6-11 times per year	1 time per month	2-3 times per month	1 time per week	2 or more times per week

31. How often do you pray? (Choose one)

A	B	C	D	E	F	G
Never	Less than once per month	1-3 times per month	1 time per week	2-6 times per week	1 time per day	2 or more times per day

Demographic Questions

The following questions are designed to help us know a little about the person participating in the study.

32. What is your marital status?.....
- A. Single
 - B. Married
 - C. Separated
 - D. Divorced
 - E. Widowed
33. What is your sex?
- A. Male
 - B. Female

Demographic Questions (continued)

34. What is your ethnicity?
- A. Caucasian
 - B. African-American
 - C. Latino/a
 - D. Southeast Asian (China, Japan, Korea, Vietnam, etc.)
 - E. South Asian (India, Pakistan, Bangladesh, etc.)
 - F. Native American
 - G. Pacific Islander
 - H. Other
35. What is your current educational status?
- A. Freshman
 - B. Sophomore
 - C. Junior
 - D. Senior
36. What is your religious preference?
- A. Protestant
 - B. Roman Catholic
 - C. Orthodox (e.g., Greek or Russian Orthodox)
 - D. Mormon
 - E. Jewish
 - F. Muslim
 - G. Hindu
 - H. Other
 - I. None
37. If you listed Protestant as your religious preference which of the following is your denomination preference.....
- A. Baptist
 - B. Methodist
 - C. Presbyterian
 - D. Episcopalian
 - E. Lutheran
 - F. Pentecostal/Assembly of God
 - G. Church of Christ
 - H. Non-denominational
 - I. Other

Demographic Questions (continued)

38. What is your parent(s) religious preference?
- A. Protestant
 - B. Roman Catholic
 - C. Orthodox (e.g., Greek or Russian Orthodox)
 - D. Mormon
 - E. Jewish
 - F. Muslim
 - G. Hindu
 - H. Other
 - I. None
39. If you listed Protestant as your parent(s)' religious preference which of the following is their denomination preference... ..
- A. Baptist
 - B. Methodist
 - C. Presbyterian
 - D. Episcopalian
 - E. Lutheran
 - F. Pentecostal/Assembly of God
 - G. Church of Christ
 - H. Non-denominational
 - I. Other

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