



2011

# Spirituality and Physical Health: Identifying Possible Mediators Utilizing the Quadripartite Framework of Spirituality

Meghanne Reilly Sennott  
*Loyola University Chicago*

## Recommended Citation

Sennott, Meghanne Reilly, "Spirituality and Physical Health: Identifying Possible Mediators Utilizing the Quadripartite Framework of Spirituality" (2011). *Dissertations*. Paper 225.  
[http://ecommons.luc.edu/luc\\_diss/225](http://ecommons.luc.edu/luc_diss/225)

This Dissertation is brought to you for free and open access by the Theses and Dissertations at Loyola eCommons. It has been accepted for inclusion in Dissertations by an authorized administrator of Loyola eCommons. For more information, please contact [ecommons@luc.edu](mailto:ecommons@luc.edu).



This work is licensed under a [Creative Commons Attribution-Noncommercial-No Derivative Works 3.0 License](https://creativecommons.org/licenses/by-nc-nd/3.0/).  
Copyright © 2011 Meghanne Reilly Sennott

LOYOLA UNIVERSITY CHICAGO

SPIRITUALITY AND PHYSICAL HEALTH: IDENTIFYING POSSIBLE  
MEDIATORS UTILIZING THE QUADRIPARTITE FRAMEWORK OF  
SPIRITUALITY

A DISSERTATION SUBMITTED TO  
THE FACULTY OF THE GRADUATE SCHOOL  
IN CANDIDACY FOR THE DEGREE OF  
DOCTOR OF PHILOSOPHY  
PROGRAM IN APPLIED SOCIAL PSYCHOLOGY

BY

MEGHANNE REILLY SENNOTT

CHICAGO, IL

MAY 2011

Copyright by Meghanne Reilly Sennott, 2011  
All rights reserved.

To my husband and our son

## TABLE OF CONTENTS

LIST OF TABLES	vii
LIST OF FIGURES	ix
ABSTRACT	x
CHAPTER ONE: RELIGION, SPIRITUALITY AND HEALTH	1
Main Findings	2
Mediators of Religion, Spirituality and Health	4
Biological-Physiological Pathways	4
Coherence and Meaning	6
Health Behaviors and Lifestyle	7
Positive Emotions/States	8
Religious Coping	9
Social Support	10
Negative Effects	12
Methodological Criticisms	13
Defining and Measuring Religion and Spirituality	14
Spirituality and Religion as Multidimensional Constructs	15
The Importance of Theory	19
The Quadripartite Framework of Spirituality	20
The Four Components of Spirituality	22
Application of the Quadripartite Framework of Spirituality	25
The Present Study	27
CHAPTER TWO: METHOD AND PROCEDURE	28
Participants	28
Measures	28
Spirituality	28
Physical Health	31
Meaning and Coherence	31
Health Behaviors	32
Social Support	32
Positive Emotions	33
Religious Coping	33
Demographics	34
Procedure	34
CHAPTER THREE: RESULTS	39
Religious Attendance	39

Exploratory Factor Analysis	39
Extraction	40
Number of Factors	40
Correlations of the Spirituality Scales and Subscales with Physical Health	50
Correlations: All Measures	50
Spirituality Measures	50
Health Measures	52
Positive Emotions	53
Religious Coping	54
Sense of Coherence	54
Social Support	56
Religious Attendance	56
Mediation Analysis	56
Moderation Analysis	56
Post-Hoc Probing of Significant Moderator Effects	59
CHAPTER FOUR: DISCUSSION	67
Factor Analysis	68
Correlations: Spirituality and Physical Health	70
Correlations: All Measures	72
Mediation and Moderation	76
Limitations	78
Conclusions	79
APPENDIX A: MULTIDIMENSIONAL MEASURE OF SPIRITUALITY	81
APPENDIX B: IRONSON-WOODS SPIRITUALITY RELIGION INDEX	83
APPENDIX C: SYMPTOM CHECKLIST	85
APPENDIX D: ORIENTATION TO LIFE QUESTIONNAIRE	87
APPENDIX E: HEALTH BEHAVIORS	90
APPENDIX F: SOCIAL SUPPORT QUESTIONNAIRE	93
APPENDIX G: LIFE ORIENTATION TEST	96
APPENDIX H: SATISFACTION WITH LIFE SCALE	98
APPENDIX I: BRIEF RCOPE	100
APPENDIX J: DEMOGRAPHICS	102

REFERENCE LIST	104
VITA	112

## LIST OF TABLES

Table 1 Demographics	29
Table 2 Descriptive Statistics for all Included Measures	30
Table 3 Bivariate Correlations for all Measures (a)	35
Table 4 Bivariate Correlations for all Measures (b)	36
Table 5 Bivariate Correlations for all Measures (c)	37
Table 6 Bivariate Correlations for all Measures (d)	38
Table 7 Communalities Complete 27 Item MMS	41
Table 8 Descriptive Statistics for 27 Item MMS	42
Table 9 One Sample Kolmogorov-Smirnov Test	42
Table 10 Parallel Analysis	44
Table 11 Total Variance Explained	46
Table 12 Goodness of Fit Test	46
Table 13 Pattern Matrix	48
Table 14 MMS Scale Items' Factor Loadings	49
Table 15 Bivariate Linear Regression Analysis: MMS and Physical Health	57
Table 16 Bivariate Linear Regression Analysis: Ironson-Woods SR Index and Physical Health	58
Table 17 Bivariate Linear Regression Analysis: Spirituality and Physical Health Moderation: Religious Affiliation	61
Table 18 Bivariate Linear Regression Analysis: Spirituality and Physical Health Moderation: Religious Attendance	62

Table 19 Bivariate Linear Regression Analysis: Spirituality and Physical Health Moderation: Post-Hoc Probing, Religious Yes	63
Table 20 Bivariate Linear Regression Analysis: Spirituality and Physical Health Moderation: Post-Hoc Probing, Religious No	64

## LIST OF FIGURES

Figure 1 Scree Plot	45
Figure 2 Interaction: Spirituality and Ill Physical Health as Moderated by Religious Affiliation	65
Figure 3 Relationship between Spirituality and Ill Physical Health when Religious Affiliation is Equal to 1 (Religious Affiliation)	66
Figure 4 Relationship between Spirituality and Ill Physical Health when Religious Affiliation is Equal to 0 (No Religious Affiliation)	66

## ABSTRACT

The purpose of this study was to further understand the relationship between spirituality and physical health. Contrary to popular assumption, spirituality and religion do not relate to physical health in the same manner. In this investigation, although religious attendance was significantly related to physical health, spirituality was not significantly associated with physical health. In fact, religious affiliation was found to moderate the relationship between spirituality and physical health. The interaction suggests that there is a positive relationship between spirituality and ill physical health for those with no religious affiliation, but no relationship between spirituality and physical health for those with a religious affiliation. The Multidimensional Measure of Spirituality (MMS) is presented with evidence for its validity and reliability. Three factors were identified on the MMS (Affective, Cognitive-Behavioral, and Relational-Connective). The Relational-Connective factor was significantly associated with poorer levels of physical health. Possible explanations for the findings as well as limitations and directions for future research are discussed.

## CHAPTER ONE

### RELIGION, SPIRITUALITY, AND HEALTH

The study of religion, spirituality and health has given rise to a number of studies documenting the positive relationships between religious involvement and physical health (Oman & Thoresen, 2002). In the late 1980s, researchers reviewed the array of evidence concerning religious effects on physical health outcomes, including heart disease, hypertension, stroke, cancers, physical disability, self-reported symptoms and mortality risk (e.g. Jarvis and Northcott 1987; Levin and Vanderpool, 1987). The evidence revealed rates of morbidity and mortality vary across religious denominations and across levels of religious involvement (Ellison, 1998). Despite variability in the particular health outcomes and the religious measures used, most of the studies currently tend to show statistically significant beneficial effects of religious involvement on health (Ellison & Levin, 1998).

Research on religion and health to date has focused primarily on four dimensions of religion: public participation, religious affiliation, private religious practices and religious coping (George, Ellison, & Larson, 2002). Correlations among these dimensions tend to be positive but of modest magnitude and variable statistical significance (George et al., 2002). Of the four factors, attendance at religious services is most strongly related to physical health, mental health and mortality in community based samples (Ellison,

1995; Koenig, George, Cohen, et al., 1998; Koenig et al., 1999). Religious service attendance is also the strongest predictor of the prevention of illness onset (George, Larson, Koenig, & McCullough, 2000). People who attend religious services once a week or more typically have fewer illnesses, recover more quickly from illness, and live longer than individuals who attend less frequently (George et al., 2002).

### **Main Findings**

Currently, there are over two dozen studies which associate religious service attendance with lower all-cause mortality (McCullough, Hoyt, Larson, Koenig, & Thoresen, 2000; Oman & Reed, 1998; Strawbridge, Cohen, Shema, & Kaplan, 1997). An eight year follow-up of more than 20,000 adults representative of the US population found a life expectancy gap of over seven years between persons never attending services and those attending more than once weekly, similar to the female-male and Caucasian-African American gaps in the United States life expectancy (Hummer, Rogers, Nam, & Ellison, 1999).

Oxman and colleagues (1995) report that the risk of 6 month mortality among patients undergoing elective open heart surgery is significantly higher among those who do not receive strength and comfort from their religious faith as compared with more religious patients (Ellison & Levin, 1998). Strawbridge and colleagues (1997) indicate that religious attendance reduces 28 year mortality risk due partly to enhanced social ties and improved health behaviors. An analysis by Idler and Kasl (1992) found evidence that community dwelling elders in New Haven may actually postpone the timing of their death until the conclusion of major holidays (Ellison & Levin, 1998).

To address a gap in the research concerning the use of meta-analytic methods to examine the association of religious involvement and physical health, McCullough, Hoyt, Larson, Koenig and Thoresen (2000) conducted a meta-analysis of the research on religious involvement and mortality. The odds ratio for the omnibus analysis based on 42 independent studies was 1.29 indicating that across all studies highly religious individuals had odds of survival approximately 29% higher than those of less religious individuals (McCullough et al., 2000). The authors concluded that religious involvement has a nontrivial, favorable association with all cause mortality (McCullough et al., 2000).

Powell, Shahabi, and Thoresen (2003), employed a levels-of-evidence approach in which hypotheses about the connection between religion or spirituality and physical health were evaluated using studies that provide the strongest methodologies and thus have the lowest risk of bias and/or confounding (Powell et al., 2003). Criteria for the exclusion of studies included: no attempt to control for any potential confounder, cross-sectional design, inadequate measurement of religion or spirituality or physical health, no statistical analyses, and earlier reports on the same cohort (Powell et al., 2003).

The authors concluded that religion and spirituality could have an impact on physical health as a protective resource that prevents the development of disease in healthy people, and/or as a coping resource that buffers the impact of disease in patients (Powell et al., 2003). However, evidence is strongest and most consistent for a protective effect in healthy people, and this support centers largely on the hypothesis that church service attendance protects against death (Powell et al., 2003).

## **Mediators of Religion, Spirituality and Health**

A central and ongoing issue is identifying the mechanisms by which religion benefits health (George et al., 2002). Major categories of mediators have been examined to varying degrees and with varying success (George et al., 2002) and include (1) biological-physiological pathways, (2) coherence and meaning, (3) health behaviors and lifestyle, (4) positive psychological states and emotions, (5) religious coping, and (6) social support.

### **Biological-Physiological Pathways**

Most of the biological-physiological pathways studies analyze the biological correlates of religious practices and their relationships to blood pressure, lipid profiles or immune function (Seeman, Dubin, & Seeman, 2003). Blood pressure studies reveal a generally consistent pattern relating greater religious involvement to lower blood pressure and lower prevalence of hypertension (Seeman, et al, 2003). Only two studies actually include prospective evidence linking initial religious involvement to lower subsequent blood pressure (Koenig et al, 1998 and Timio et al., 1997). The remainder of these studies present cross-sectional data showing relationships between religious involvement and lower blood pressure (Seeman et al., 2003).

In one study, Orthodox Jews in Jerusalem were found to have lower total cholesterol, triglyceride, and LDL cholesterol levels. These differences were found to be largely due to differences in diet (Seeman et al., 2003). Studying HIV-positive gay men, (Woods, Antoni, Ironson, & Kling, 1999) religious behaviors were associated with higher T helper and inducer cell counts and higher CD4+ percentages. In addition, greater spirituality was associated with lower cortisol which partially accounted for the link

between spirituality and longer term survival in HIV patients (Ironson, Solomon, Balbin, O’Cleirigh, George, Kumar, Larson, & Woods, 2002). Similarly, women with metastatic breast cancer who gave high ratings to the importance of spiritual expression in their life had greater numbers of white blood cells and total lymphocyte counts (Sephton, Koopman, Schaal, Thoresen, & Spiegel, 2000).

Most of the research exploring the biological-physiological pathways analyzes the effects of religious practices, especially meditation. Although the considerable large body of research in this area is too large to be presented here (Seeman et al., 2003), of particular interest is an examination of the effects of an eight week meditation/relaxation intervention (Patel, Marmot, Terry, Carruthers, Hunt & Patel, 1985). Over 200 participants who were identified as being at high risk for cardiovascular disease (e.g. having two or three of the major risk factors for cardiovascular disease smoking, blood pressure, cholesterol) were randomized into eight sessions of treatment (health education and meditation/relaxation training) or control (health education only) (Patel et al., 1985). Subjects in the meditation/relaxation group exhibited significantly greater decreases in blood pressure at eight weeks, eight months and four years post intervention and lower cholesterol levels at eight weeks and eight months post intervention (Patel et al., 1985). Electrocardiograph evidence for greater ischemia and greater incidence of cardiac events was reported in the control group at four years post intervention (Patel et al., 1985).

Despite the large body of research examining meditation practices and health, relatively limited attention has been given to the physiological aspects of the religion health relationship (Seeman et al, 2003). A cautious interpretation of the evidence at this point might be that aspects of religion and spirituality may perhaps be linked to

physiological processes including cardiovascular, neuroendocrine, and immune function (Seeman et al., 2003).

### Coherence and Meaning

The coherence hypothesis posits religion benefits health because it provides a sense of coherence and meaning such that people understand their role in the universe, the purpose of life and develop the courage to endure suffering (George et al., 2000). Although the number of studies is few, they consistently report that a sense of coherence explains a significant proportion of the relationship between religious involvement and health ranging from 20% to 30% (George et al., 2003).

Antonovsky (1980) introduced the construct, sense of coherence (SOC) as a worldview regarding the nature of the human existence in general rather than one's personal life circumstances and suggested that individuals are more likely to develop a SOC (or lack of it) based on the belief systems of their cultures and the social institutions in which they participate (George et al., 2002). Several authors have suggested that religions typically provide their members with a worldview and often this worldview would seem to meet Antonovsky's concept of SOC (George et al., 2002). Investigators have hypothesized that SOC may mediate the relationship between religious participation and health but this hypothesis has not yet been directly tested (George et al., 2002).

Ryan, Rigby and King (1993) compared two groups of persons who attended religious services regularly: those who reported that their religious beliefs serve as the major motivation and explanation for behaviors and those who viewed their religious beliefs as appropriate guidelines for behavior but not as their major motivation.

The former, averaged significantly fewer symptoms of depression, anxiety, and

somatization than the latter (George et al., 2002). A reasonable goal for future research would be to compare global and specific belief structures related to religious participation as possible mediators of the religion health connection (George et al., 2002).

### Health Behaviors and Lifestyle

A substantial body of literature has examined the associations between religious involvement and health and lifestyle behaviors (Chatters, 2000). Health related behaviors, such as drugs and alcohol use and illicit sexual behavior are related to religious commitment (Hill & Butler, 1995). Perkins (1985) found that a commitment to a Judeo-Christian faith tradition was one of the most significant moderating influences on drug and alcohol use among college students (Hill & Butler, 1995).

Some religions include prohibitions against behaviors that place health at risk (e.g. use of tobacco, use of alcohol at all or in excess, use of illegal drugs, risky sexual behavior and violence) (George et al., 2000). Other religions encourage health promotion as a result of viewing the body as having spiritual as well as material significance (George et al., 2000). It is this area that denominational differences in health are most striking (George et al., 2000). The Mormons, Adventists and other denominations with strict behavioral proscriptions concerning health related behaviors are healthier and live longer than members of other faiths, as well as those persons who are not involved in religion (George et al., 2000). These religious groups have significantly lower rates of many chronic diseases such as cancer (Ellison & Levin, 1998). Regardless of denomination, people who report higher levels of religious involvement engaged in fewer risky behaviors than their nonreligious peers (George et al., 2000).

Thus, evidence suggests that health behaviors are one of the mechanisms by which religious involvement benefits health (George et al., 2000). The amount of variance explained by health behaviors is small, however – about 10% (George et al., 2000). Health practices have been found to partially explain the effects of service attendance on mortality, over intervals ranging between 3 and 28 years (Hummer et al., 1999; Oman and Reed, 1998; Strawbridge, et al., 1997).

#### Positive Emotions/States

Religiously stimulated emotions may provide another possible link with health status. Religious involvement may lead to positive emotions such as forgiveness, contentment and love as well as to negative emotions thus inspiring catharsis among parishioners (Ellison, 1998). Furthermore, aspects of religious involvement have been associated with feelings of self-esteem and personal efficacy (Ellison, 1998). Such positive self-perceptions are sometimes viewed as indicators of mental health in their own right and are associated with a wide range of other beneficial health outcomes (Ellison, 1998).

Furthermore, hope and optimism inspired by personal faith along with the broad sense of order and coherence that can result from sustained religious practice may help to account for observed religious variations in mental and physical health (Koenig, 1994). Religious faith can provide a sense of hope that offers both emotional and tangible means of promoting well being, especially for older adults (Ellison & Levin, 1998).

Psychosocial resources such as self-esteem, self-efficacy and mastery may partially explain the health benefits of religious participation (George et al., 2002). There is substantial evidence that religious participation is associated with higher levels of these

psychosocial resources and that these resources are associated with better health, although these conclusions rest largely on cross-sectional studies (Ellison & Levin, 1998; George et al., 2002).

### Religious Coping

Studies indicate religious coping is significant for mental and physical health outcomes for a variety of life circumstances, especially health problems and bereavement (Chatters, 2000). Religious coping also appears to reduce levels of depression and anxiety in connection with bereavement and other loss events (Mattlin, Wethington, & Kessler, 1990). These crises may challenge notions that the world is just and that people get what they deserve (Ellison & Levin, 1998). There is mounting evidence that religious cognitions and behaviors can offer effective resources for dealing with stressful events and conditions (Steger & Frazier, 2005). Coping with stress, has been shown to be a powerful factor in both preventing disease and hastening recovery from illness (Ellison & Levin, 1998).

Personal religious coping activities, such as prayer, scripture study, and seeking religious comfort have been found to be particularly important in blood pressure (Steffen, Hinderliter, Blumentha, & Sherwood, 2001), a relationship found to be stronger among Africa Americans than Caucasians. In a cross-sectional study, Pargament, Smith, Koenig, and Perez (1998) found indicators of poor physical health were associated with both positive and negative religious coping suggesting that poor physical health may represent a stressor that mobilizes higher levels of religious coping. Although this conclusion is in line with previous findings in the literature (e.g. Ellison & Taylor, 1996), they suggest

that longitudinal studies are needed to further understand the effects of religious coping on physical health (Pargament et al., 1998).

### Social Support

Social resources grant a number of benefits and may include the size of one's social networks, frequency of interactions, exchanges of various types of informal and formal assistance, and positive perceptions of support relationships (Chatters, 2000). Religious organizations constitute natural environments for the development of both formal and informal support relationships (Chatters, 2000). Churches and synagogues provide opportunities for regular interaction and friendship formation among like-minded persons (Ellison, 1998).

Relative to their nonreligious peers, persons with high levels of public religious participation report larger social networks and more interactions with their social networks and they receive more assistance from others and higher levels of satisfaction with their social support (George et al, 2000). Despite this, social support explains only 5% to 10% of the relationship between religion and health (George et al, 2000).

Regular church attendance may also encourage meaningful social roles that provide a sense of self worth and purpose through the act of helping (Powell et al., 2003). This is in contrast to the more common conceptualizations of social support where the emphasis is on being helped (Powell et al., 2003). Helping others appears to bolster feelings of personal control and to lower feelings of depression (Krause, Herzog, & Baker, 1992).

The experience of helping others can benefit support providers as well as recipients and may be especially satisfying due to the shared beliefs about suffering,

altruism and reciprocity that may exist among coreligionists (Ellison, 1998). Activities that encourage helping behavior, such as volunteerism; have been shown to reduce mortality (Musick, Herzog, & House, 1999; Oman, Thoresen, & McMahon, 1999). This proposed pathway of altruism gains support from an investigation of religion and health in a HIV sample (Ironson et al., 2002). The authors found a measure of religiousness-spirituality was associated with positive emotions and decreased physiological reactivity and this association was driven by helping others with HIV (Ironson et al., 2002). The authors (Ironson et al., 2002) suggest that “the combination of strength and comfort from religion and social participation may be a particularly potent one, especially for people with HIV who are often stigmatized and may have to refine new social networks and ‘families’” (p.46)

Other findings have included two cross-sectional studies that demonstrate the mediating role social support may play in the religion health relationship. Ferraro and Koch (1994) found that social support was not a significant mediator for Caucasians but explained 25% of the relationship between religious participation and physical health for African Americans. Reynolds and Kaplan (1990) found that lack of church membership and feeling socially isolated predicted increased rates of hormone related cancers for women but not men (Hill & Butler, 1995). Clearly much more research is needed before firm conclusions can be reached about the possible role that social support plays as a mechanism by which religious involvement promotes health (George et al., 2002). Social support given or received from fellow congregation members may be the pathway by which social support mediates the effects of religion on health (George et al., 2002; Powell et al., 2003).

## Negative Effects

It is noteworthy that not all theorizing and research examining the relationship between religion and health has been positive; religion may also be associated with negative health outcomes (Chatters, 2000). The most obvious cases are associated with extreme groups who are typically fanatical in nature and practice (Hill & Butler, 1995). Certain cults and religious sects may encourage behaviors that do not promote good health, such as ritual suicide or self-abuse as purification exercises (Hill & Butler, 1995). For those who do not belong to cults or sects and instead associate with more mainstream religion, the negative effects of religion on health are less obvious (Hill & Butler, 1995).

Although participation in religious groups may be beneficial, these relationships can also be a source of distress (Chatters, 2000). Living up to perceived expectations and idealized notions of family life, spirituality, and moral and ethical conduct may also cause distress for some individuals (Ellison & Levin, 1998). Religious doctrines may also produce emotions such as guilt, shame, and anxiety, pessimism and prejudicial beliefs that reinforce negative views of humanity and the self (Chatters, 2000). Pargament found that some religious coping styles yield pathological health related consequences (Ellison & Levin, 1998).

Persons who use negative coping tend to view the world as threatening, express a less secure relationship with God, and demonstrate a sense of spiritual struggle (Chatters, 2000). Negative religious coping responses include a focus on righteous anger, prayers for divine vengeance and feelings of divine abandonment (Ellison & Levin, 1998). Negative coping has been associated with greater depression and psychological symptoms, poorer life quality and less sociability (Chatters, 2000).

### **Methodological Criticisms**

Recently, Sloan and colleagues criticized the quality of research linking religious factors to health (Miller & Thoresen, 2003; Sloan & Bagiella, 2002). Their criticisms include the misuse of statistics, inappropriate designs, inadequate sampling, and post hoc findings of studies not primarily about religiousness and failure of religious factors to demonstrate a unique main effect (Miller & Thoresen, 2003). Numerous authors (e.g. Koenig, Idler, Kasl, Hays, George, & Musick, 1999; Miller, & Thoresen, 2000) acknowledged that Sloan's (2002) arguments were not without merit. However, they did not completely agree with his assessment of the quality of research nor did they accept the conclusion that "there is little empirical support for claims of health benefits deriving from religious involvement" (p.20). Conversely, these authors contend that the evidence, though not definitive or conclusive, is sufficient to warrant further methodologically sound investigations that will further refine the effects of religiousness and spirituality on physical health (Miller & Thoresen, 2003).

Methodological issues that continue to nag the field are its reliance on cross-sectional studies; the lack of longitudinal, experimental and qualitative designs; imprecise measurement of religion, spirituality, health or covariates; a failure to control for multiple tests; utilizing one-tailed tests of significance, and the characteristics of samples (e.g. Thoresen & Harris, 2002; Chatters, 2000; Ellison & Levin, 1998; George et al., 2000; Powell et al., 2003; Miller & Thoresen, 2003; Sloan & Bagiella, 2002).

Despite the commencement of more sophisticated research, measurement of spiritual or religious constructs in health research continues to be poor in quality, often consisting of a single question (Miller & Thoresen, 2003). Highlighting the possibility of

misleading results and limitations of using one-dimensional measures (e.g. religious attendance, affiliation), Sloan and Bagiella (2002) contend “studies of denominational differences in health have conveyed no information on the health value of religious involvement ...unless it was implied that these denominational differences were associated with differences in religiosity, these studies are irrelevant to assertions of health advantages of religious involvement” (p.15). Perhaps, most alarming, is the lack of theoretically based measures and definitions of religion and spirituality. In other words, the fundamental vocabulary for the religion, spirituality, and health relationship does not exist.

### **Defining and Measuring Religion and Spirituality**

In a review of more than 200 measures of religion and spirituality, the National Institute of Healthcare Research (NIHR) discovered many were single-item measures; most of the measures had little if any psychometric assessment, lacking reliability and validity information; and few measures had been used in a sufficient number of studies to generate a knowledge base about how the measure operated across settings and samples (George et al., 2000). Furthermore, less than 10% of the measures reviewed by the NIHR panel included any mention of spirituality. When mentioned, spirituality is typically linked with religion (e.g. your religious and/or spiritual beliefs) (George et al., 2000). At present, the field lacks a body of well-designed studies of spirituality as distinct from religion and of its relationship to health (Miller & Thoresen, 2003).

Matthews and colleagues (1993) recommended that a multidimensional assessment of religiousness at minimum include not only church attendance, personal devotions and prayers, and religious social support measures but also religious history

including when any major religious commitments and or changes may have occurred (Hill & Butler, 1995). George and colleagues (2000) state “it would be extraordinarily helpful to the integration of the field if consensual conceptual definitions of spirituality and religiousness were adopted” (p.112). However, others suspect that any scientific operational definition of spirituality is likely to differ from what a believer means when speaking of the spiritual (Miller & Thoresen, 2003).

Moreover, this difference of meaning creates an inherent definitional if not procedural tension in the study of spirituality (Miller & Thoresen, 2003). Beyond the natural language issues, groups of scientists working toward operational definitions of spirituality or religiousness have agreed in at least one regard: these are complex phenomena (Miller & Thoresen, 2003). Once spirituality and religiousness are conceptualized as multidimensional constructs, definitional issues may become clearer (Miller & Thoresen, 2003). No scientific consensus yet exists on these issues.

### **Spirituality and Religion as Multidimensional Constructs**

Some researchers have spoken out against the use of single strand definitions and one-dimensional conceptualizations because they are inadequate to the research on religion and spirituality given the field’s demand for sophisticated theory (Zinnbauer & Pargament, 2005). Other researchers have developed multidimensional frameworks (e.g. Beck, 1986; Helminiak, 1996). For example, LaPierre (1994) identifies six components: (1) search for meaning in life, (2) an encounter with transcendence, (3) a sense of community, (4) a search for ultimate truth or highest value, (5) a respect and appreciation for the mystery of creation, and (6) a personal transformation (Hill, et al., 2000). An alternative multidimensional framework was applied by Spilka (1993) following his

review of the literature on the contemporary conceptualizations of spirituality. Spilka claims that most modern-day understandings fall into one of three categories: (1) a God-oriented spirituality where thought and practice are premised in theologies either broadly or narrowly conceived, (2) a World-oriented spirituality stressing one's relationship with ecology or nature, or (3) a Humanistic-oriented spirituality stressing human achievement or potential (1993).

These more recent investigations echo earlier attempts to assess these various definitions of religion and spirituality. In 1958, Clark asked 68 psychologists, psychiatrists, ministers, religious scholars, sociologists, anthropologists and philosophers to define religion (Zinnbauer, Pargament, & Scott, 1999). Concepts in the various definitions ranged from supernatural and mystical experiences to church membership and Clark concluded that religion has many facets and that social scientists "mean very different things by the terms 'religious'" (Clark, 1958, p.146). In a similar vein, Scott (1997) performed a content analysis of a sample of 31 definitions of religiousness and 40 definitions of spirituality, which appeared in the social scientific literature over the last century (Zinnbauer, et al., 1999). Scott developed nine content categories that captured both sets of definitions: (1) experiences of connectedness or relationship, (2) processes leading to increased connectedness, (3) behavioral responses to something sacred or secular, (4) systems of thought or sets of belief, (5) traditional institutional or organizational structures, (6) pleasurable states of being, (7) beliefs in the sacred, the transcendent, etc., (8) attempts at or capacities for transcendence, and (9) concern with existential questions or issues (Scott, 1997). As summarized by Zinnbauer and colleagues

(1999), the analyses suggest that no single category accounted for the majority of definitions.

In a pioneering study, Zinnbauer and numerous colleagues sought to understand how individuals define both religion and spirituality and individuals' perceptions of the degree to which the two constructs were related (Zinnbauer, et al., 1999). This provided one of the first examinations of how the general public conceptualizes spirituality and religion. Comparable to Scott's (1999) content analysis, the overall content of each of the definitions was analyzed and placed into 14 categories. The categories are: (1) feeling or aimed at attaining a desirable inner affective state such as comfort, anxiety reduction, security, (2) having or striving to gain meaning, (3) aimed at obtaining personal growth, actualization, mastery of self-control, (4) concern for others, aimed at obtaining a better world, (5) hope, (6) having or striving to gain control over problems or ability to solve problems, (7) negative means or ends such as gaining extrinsic rewards, feelings superior to others, an excuse to avoid personal responsibility, (8) feeling of experience of connectedness, relationship, oneness with God, Christ, higher power, transcendent reality, nature, etc, (9) personal beliefs such as belief or faith in God or higher power, (10) personal worship or practices such as prayer, Bible reading, meditation, etc, (11) organizational practices or activities such as attendance at services, performance of rituals, church membership, (12) commitment to organizational beliefs or adherence to institutionally based belief systems or dogma, (13) integrating one's value or beliefs with one's behavior in daily life, following God's will in one's life, demonstrating God's love to others, and (14) uncodable.

As with Scott's findings, no one single content category accounted for the majority of the definitions and the results from this analysis are indicative of a sizable amount of variability in definitions of spirituality. Interestingly, it appears that the diversity found in researchers' views about spirituality and religion is very similar to the variety of content found among the general public. Numerous scholars have commented that although there is agreement in the literature that spirituality is multidimensional (e.g. Paloutzian & Park, 2005), a comprehensive, unifying theory that can account for this complex construct remains to be found (e.g. Zinnbauer, et al., 1999; Hill and Pargament, 2003; Zinnbauer & Pargament, 2005).

Important factors that contribute to the lack of widely accepted definitions and theoretical frameworks are the commonly used methodology, measures and samples in the study of religion and spirituality. "Today the methodological discussion is about whether psychologists of religion should use quantitative methods versus qualitative methods" (Paloutzian & Park, 2005, p.12). Learning from the fields of anthropology and sociology the answer is both; the two approaches are complementary and both sides have much to offer (Corveleyn & Luyten, 2005). Furthermore, as Zinnbauer and Pargament (2005) argue, "limiting the study of religiousness and spirituality to simple quantitative behaviors such as the number of church services attended in the week or the number of praying behaviors completed each day ... falls short of the depth of human experience touched by religiousness and spirituality ... we must not limit investigations based on the ease of measurement" (p.30).

In addition to the field of Psychology, the study of religion and health is enriched by the involvement of other disciplines. However, this provides a challenge to the field as

well. It is difficult to appreciate disciplinary differences in conceptual frameworks, methodological and analytical approaches, relevant contextual issues and levels of inquiry (Chatters, 2000). Furthermore, one of the most difficult and perplexing issues in the field, that of defining religion and spirituality, magnifies the lack of communication pathways among the fields.

Health researchers are often unfamiliar with measurement strategies from the social and behavioral sciences. There is a tendency to rely on objective and behavioral reports of religious involvement and to ignore other aspects of religion that reflect functional relationships with health outcomes (Chatters, 2000). This situation is exceedingly complex because these multiple components of religious involvement demonstrate divergent relationships to health outcomes (Koenig, Cohen, George, Hays, Larson, & Blazer, 1997). Because commonly used measures of religious behaviors may tap poorly, or not at all, the mechanisms via which religion really influences mental and physical health, the evidence for religious effects on health outcomes remains somewhat mixed (Ellison & Levin, 1998).

### **The Importance of Theory**

Over 40 years ago, Dittes pointed out that the psychology of religion is long on data and short on theory (1969). Even today, Hill (2005) argues what is missing from the measurement paradigm is a conceptual or theoretical focus that provides coherence to the field, resulting in a call for more systematic programs of research with stronger conceptual bases. Despite the constant urging of researchers to develop a theoretical foundation for research, Paloutzian and Park (2005) argue that even today, none of the standard texts of the field “presents ideas that cut across the range of topics in the field

and that can serve as comprehensive integrating devices” (p.5). This must change for the field to move forward.

With all these concerns and challenges in mind, it is tempting to relent to the frustration or throw up our hands, as Zinnbauer and colleagues (1999) say, and argue after Allport (1950) that religion and spirituality are subjective phenomena unique to each individual. But, is it really giving up if we agree with Allport? Perhaps definitions of religion and spirituality are personal and idiosyncratic and it might be reasonable and correct to view them as such. This view, however, does not preclude the application of an organizing framework to the distinctive definitions of spirituality. Such a multidimensional framework could perhaps yield a clearer understanding of spirituality as a psychological construct.

### **The Quadripartite Framework of Spirituality**

In a series of qualitative studies, Reilly and Heath (2007) examined the definitions of spirituality generated by participants and four factors were identified. A new theory was proposed that can provide the theoretical foundation for evaluating spirituality as a psychological construct. Although complex, spirituality, and its diverse definitions, can be understood through a common psychological framework, known as The Quadripartite Framework of Spirituality (Reilly, 2007; Reilly & Heath, 2007) (QFS, Reilly 2010).

This framework grew from the tripartite or three-component model (Katz & Stotland, 1959; Rosenberg & Hovland, 1960), which is associated most strongly with the study of attitudes (e.g. Eagly & Chaiken, 1993; Fazio & Olson, 2003). Typically, social psychologists divide attitudes into three main components: a cognitive component, an affective component, and a behavioral component (Olson & Zanna, 1993). In this view,

the attitude is an unobservable psychological construct which can reveal itself in attitude appropriate beliefs, feelings and behavioral components (Eagly & Chaiken, 1993).

The application of this triadic structure is not limited to social psychologists. Personality psychology theorists have been proponents of applying cognitively-based (e.g. McClelland, 1985), behaviorally-based (e.g. Skinner, 1938), or affective-based (Ekman, 1992; Averill, 1997) theories, or even combination theories (e.g. Mischel, 1999; Bandura, 1977) to understanding and conceptualizing personality structure. Likewise, in clinical psychology, different therapeutic approaches stem from these theoretically ground constructs (e.g. Cognitive-Behavioral Therapy, Rogerian or Interpersonal, Rational-Emotive Therapy, etc). Furthermore, broad movements within the field of psychology, such as Behaviorism or Humanism may be understood as reflecting this basic tripartite structure as well.

Application of this tripartite structure as a framework to the construct spirituality is reasonable given its similarity to the construct of attitudes. Both are considered to be unobservable psychological concepts that are revealed through beliefs, emotions, and behaviors. The tripartite structure provided to this research the theoretically established groundwork from which the current framework grew. A fourth dimension was present in the definitions of spirituality that could not be subsumed under any of the tripartite components. Specifically, a sense of connectedness or relatedness that is not exactly a cognition and not exactly an emotion was evident in the respondents' definitions. Incorporating this dimension into the fundamental three part structure, four components of spirituality were identified: Affective, Behavioral, Cognitive, and Relational-Connective (Reilly, 2007; Reilly & Heath, 2007).

## The Four Components of Spirituality

Definitions of spirituality are coded on the presence of four dimensions:

Affective, Behavioral, Cognitive, and Relational-Connective. This model has been labeled the Quadripartite Framework of Spirituality (Reilly, 2007; Reilly & Heath, 2007) (QFS, Reilly, 2010). Definitions of any length can be coded as reflecting one aspect to including all four aspects. Some statements or ideas can be coded into more than one category, whereas others are coded as reflecting just one. An example of a single coded statement is: “Feeling of love”, which is coded as Affective. A double coded statement: “Spirituality is seeking knowledge of God, openness to experience and a willingness to let go”, is coded as both Behavioral and Cognitive.

The coding category of Affective (coded as A) is used for responses that had feelings or emotions as the center idea (*Feeling of peace; A longing*). The category of Behavioral (coded as B) is used for responses that reflected action, direct experience, or how one lives life (*Living with God as the core of our existence; An approach to life; Experiential*). The category of Cognitive (coded as C) is assigned to responses that expressed thinking or contemplation (Stance in life in which one is actively and *consciously inquiring and reflecting* on the ultimate questions in life; *Way of perceiving and understanding* the world).

In addition to the affective, behavioral and cognitive content of the definitions, another distinct characteristic emerged from the data (Reilly & Heath, 2007). This aspect conveyed the relational and connectiveness of spirituality. Relational-Connective responses are those that conveyed connecting to something or someone, relating, a unifying force and the notion of interconnectedness (*Relationship to God;*

*Interconnectedness* of all things, *Connection* to a source of energy that comes from God who *connects* all the energy in the world).

This Relational-Connective aspect appears to be conceptually distinct from the affective, behavioral and cognitive constructs. Having a relationship with God, with the Divine, being connected to others, nature and the interconnectedness of all things are states rather than acts, beliefs or emotions. Affective, behavioral and cognitive categories fail to capture how spirituality is described as: a universal connection to all; being connected to something bigger than oneself that unites the entire universe into a whole. It is through relationships, it is through these connections that behaviors are learned and practiced, that affect is felt and shared, and that cognitions are discovered, questioned and expressed. The Relational-Connective component of spirituality is the conduit for which the other three components are experienced and expressed.

In addition to the main QFS (Reilly, 2010), another issue which emerged (Reilly & Heath, 2007) involves the relationship between religion and spirituality, either in the affirmative or negative sense. This facet of spirituality captures the confusion that has been a long-standing issue in the psychological literature: What is the relationship between spirituality and religion? Clearly individuals feel strongly on this issue and numerous opinions have been expressed by both psychologists of religion and the general public. The category of Affirmation-Nullification was assigned to those responses that actively affirmed the role of religion in spirituality or that actively nullified the role of religion in spirituality (*Grounded in religion; nothing to do with religious dogma*). This dimension is a subset of the Cognitive component.

Although the research investigating participants' definitions of spirituality and religion is limited, Zinnbauer et al. (1997) did examine self-generated definitions and also asked participants to identify which of the following statements best described them: *I am spiritual and religious; I am spiritual but not religious; I am religious but not spiritual; I am neither religious nor spiritual*. In the pilot study (Reilly, 2006) upon which the original framework is based, there were no statements or directions provided to the participants to encourage them to write about this interplay. A portion of the participants affirmed the role or nullified the role of religion in their definition of spirituality. Even though these responses were subsumed by the main four dimensions, the fact that these statements were spontaneously made speaks to the importance of continuing to explore the interplay of religion and spirituality.

There are four definitional aspects of spirituality – Affective, Behavioral, Cognitive, and Relational-Connective – that comprise the QFS (Reilly, 2007, 2010; Reilly & Heath, 2007). Responses range from one single component (e.g. Affective) to a combination of all four. There are a total of 15 distinct combinatory patterns for the four dimensions, as ordering of the categories is unimportant. For example, the pattern of affective-behavioral is analogous to behavioral-affective.

The QFS (Reilly, 2007, 2010; Reilly & Heath, 2007) can provide a theoretically-based organizing structure to spirituality. Previous research, summarized by Hill and Pargament (2003), has suggested that religion and spirituality are social psychological phenomena, are related to cognitive phenomena, are related to affect and emotion, and are prescriptions for normative behavior. The QFS (Reilly, 2007, 2010; Reilly & Heath,

2007) provides a unifying structure within which contending understandings of spirituality can be brought together.

#### Application of the Quadripartite Framework of Spirituality

This framework sheds new light on existing literature and may offer alternative interpretations of previous findings. For example, referring to the Quest Scale (Batson, 1976; Batson & Schoenrade, 1991), Batson contends that a quest orientation is “an endless process of probing and questioning” (p.32) and suggests that the quest-oriented person is interested in “hammering out his or her stance on religious questions” while not being influenced by other social and religious institutions (Batson, 1993, p.166). Within the QFS (Reilly, 2007, 2010; Reilly & Heath, 2007), this notion would be classified as cognitive. Having a quest orientation to religion [or spirituality] is positively correlated with cognitive complexity (Batson, Schoenrade & Ventis, 1993) when compared to other orientations; which is a more obvious prediction within the QFS (Reilly, 2007, 2010; Reilly & Heath, 2007). Despite the usability of the Quest Scale, it assesses only the cognitive aspect of spirituality to the neglect of the other three. The QFS (Reilly, 2007, 2010; Reilly & Heath, 2007) highlights this limitation.

Zinnbauer and Pargament (2005) argued that characterizing religion as cognitive and spirituality as emotional is inadequate at capturing the ways in which thoughts and feelings co-occur and influence one another. Specifically, they contend that “passionless religious belief and thoughtless spiritual experience are indeed possible, but are not representative of the rich ways thoughts, feelings, behaviors, motivations and experiences come together” (p.28). They further state they find it hard to imagine an individual to be

religious based solely on an idea and for an individual to be spiritual without cognitive activity. The presented QFS (Reilly, 2007, 2010; Reilly & Heath, 2007) allows for this distinction to be made and also offers an explanation. Some individuals will have a cognitive religiosity and an affective spirituality. Others may have a behavioral religiosity and a cognitive, relational-connective spirituality. Viewing spirituality through this framework allows for these differences but does so within an organizing and unifying approach.

There is a tendency to rely on objective and behavioral reports of religious involvement and to ignore other aspects of religion that reflect functional relationships with health outcomes (Chatters, 2000). Because commonly used measures of religious behaviors may tap poorly, or not at all, the mechanisms via which religion really influences mental and physical health, the evidence for religious effects on health outcomes remains somewhat mixed (Ellison & Levin, 1998). The Quadripartite Framework (Reilly, 2007; Reilly & Heath, 2007) can guide interpretations of research – it may be that a Behavioral spirituality has differential effects on health than an Affective spirituality. Furthermore, having a Relational-Connective spirituality may have differential impacts on health for women and men. Although these are conjectures with no research base, it seems the potential of the Quadripartite Framework (Reilly, 2007; Reilly & Heath, 2007) in its application to the religion-spirituality health area is great. The main mediators of the religion and health connection fit into this theoretical framework as well. The mediators that have received the most research attention have been (1) meaning and coherence, (2) health behaviors, (3) religious attendance, (4) social support, (5) positive emotions, and (6) religious coping. Each of these can be placed

within the framework: meaning and coherence-cognitive, health behaviors-behavioral, religious attendance-behavioral, social support-behavioral, relational, and affective, positive emotions -affective and religious coping - behavioral, cognitive and affective. As previously stated, each of these mediators separately accounts for anywhere between 5% and 30% of the variance of the relationship between religion and health. What if these mediators could be purposefully examined simultaneously? What would happen if a theory unified all of these different observed relationships between religion and health? The Quadripartite Framework (Reilly, 2007; Reilly & Heath, 2007) stands to facilitate the integration of the existing knowledge surrounding religion, spirituality and health and move the field forward toward a more complete understanding of these complex phenomena.

### **The Present Study**

The Quadripartite Framework of Spirituality (Reilly, 2007; Reilly & Heath, 2007) is proposed to provide a theoretical foundation for evaluating religious/spiritual relationships to health outcomes. There are eight main hypotheses driving this work. First, the factor structure identified in a previous work with the spirituality scale in a college sample (Reilly, 2008) will be replicated in this population-based sample. Second, spirituality will be significantly associated with the outcome variable, physical health. All subsequent hypotheses are contingent on the second hypothesis being confirmed; such that, if this relationship is not significant there will be no further testing because there would be no effect to mediate. The third through eighth hypotheses refer to the series of six tests of mediation for the six proposed mediators of the relationship between spirituality and physical health: (1) meaning and coherence, (2) health behaviors, (3)

religious attendance, (4) social support, (5) positive states and emotions, and (6) religious coping.

CHAPTER TWO  
METHOD AND PROCEDURE

**Participants**

The participants were 219 individuals (58% female and 39% male). Of the participants, 89% were Caucasian, 1% African American, 3% Asian, 3% Other; and 4% preferred to not respond. A wide range of ages was represented in the sample, with the majority being in the 26-35 year old age range at 36.5%. Fourteen percent of participants were between 18-25 years old, 11% were between 36-45 years old, 13% were between 46-55 years old, 14% were between 56-65 years old and 9% were 66+ years and older. In terms of religious affiliation; 35.2% of the participants were Catholic, 1.8% were Eastern Religion, 4.6% were Jewish, 26.5% were Protestant, 7.8% were Other/Not Listed, and 21.9% reported no religious affiliation. The demographics are presented in Table 1.

**Measures**

Spirituality

Participants were asked to complete the Multidimensional Measure of Spirituality (MMS) (Reilly & Heath, 2010) which inquires about various spiritual activities and understandings. MMS questions are rated from 1 (not at all) to 5 (very much so) and include “My spirituality gives me a sense of peace”, “My spirituality gives meaning tmy life”, and “My spirituality helps me to feel I have a relationship or connection with a higher form or being.” Please see Appendix A for the complete measure. Descriptive

Table 1 Demographics

Variable	Percentage
<b>Gender</b>	
Male	38.8%
Female	58.4%
<b>Ethnicity</b>	
African American/Black	1.4%
Asian	2.7%
Caucasian/White	88.6%
Hispanic	2.7%
Other/Not Listed	1.8%
<b>Age</b>	
18-25	13.7%
26-35	36.5%
36-45	11.4%
46-55	13.2%
56-65	13.7%
66+	8.7%
<b>Religious Affiliation</b>	
Eastern	1.8%
Catholic	35.2%
Jewish	4.6%
No Religious Affiliation	21.9%
Other/Not Listed	7.8%
Protestant	26.5%
<b>Religious Attendance</b>	
Never	21.9%
Once a Year	7.8%
A Few Times a Year	26.9%
Once a Month	11.0%
Once a Week	23.7%
More than Once a Week	5.9%

Table 2 Descriptive Statistics for all Included Measures

	N	Mean	Median	Mode	Standard Deviation	Variance	Skewness	Kurtosis	Range	Minimum	Maximum
Multidimensional Measure of Spirituality	219	60.3597	62	63	12.84	164.89	-.563	.598	68	17	85
Ironson-Woods SR Index	219	90.81	92	80	21.05	443.14	-.433	-.423	94	31	125
Physical Health	215	11.04	9	4	8.69	75.49	1.57	3.46	53	0	53
Health Behaviors	216	13.72	14	14	2.86	8.16	.203	-.075	16	6	22
Life Orientation Test (Optimism)	219	22.94	23	23	4.16	17.29	-.500	.119	20	10	30
Satisfaction with Life Scale	219	18.92	20	20	4.06	16.49	-.821	.844	20	5	25
Positive Religious Coping	219	14.36	15	7	4.88	23.85	-.214	-1.168	20	7	27
Negative Religious Coping	219	8.67	8	7	2.72	7.407	2.419	7.084	17	7	24
Sense of Coherence	219	60.58	62	62	10.51	110.50	-.410	-.155	55	27	82
Social Support Number	215	5.16	5	9	2.61	6.82	-.019	-1.04	10	0	10
Social Support Quality	215	4.46	4.83	5	.75	.56	-2.263	6.828	4	1	5

statistics for this measure are presented in Table 2. The reliability for this measure as assessed by Cronbach's Alpha was .909. This reliability is presented in Table 3.

Participants were asked to complete the Ironson-Woods Spirituality/Religion (SR) Index (Ironson et al., 2002). The Ironson-Woods SR Index is a 25 item measure inquiring about various spiritual and religious beliefs, behaviors and attitudes. Items include, "My beliefs give meaning to my life," "I pray or meditate to get in touch with God," and "My beliefs help me feel compassion/love/respect for others." Please see Appendix B for the complete measure. The descriptive statistics for this measure are presented in Table 2. The reliability for the Ironson-Woods SR Index in this sample was .951 and is presented in Table 3.

#### Physical Health

Participants were asked to complete a 25 symptom checklist adapted from the Seriousness of Illness Rating Scale (Wyler, Masuda, & Holmes, 1986). The 25 item checklist includes items such as the common cold, sore throat, headache, and stomachache. In addition, participants were asked the number of visits they have made to a doctor. Higher scores on this scale measure ill physical health. Please see Appendix C for the complete measure. The descriptive statistics for this measure are presented in Table 2. The reliability for this measure in this sample was .874 and is presented in Table 4.

#### Meaning and Coherence

Participants were asked to complete the Orientation to Life Questionnaire (Antonovsky, 1987, 1993). This measure assesses Sense of Coherence and is comprised

of 13 items rated by various likert-type scales ranging from 1 to 7. Examples of the scales include “Very Often” to “Never” and “No clear goals or purpose at all” and “Very clear goals and purpose.” Items include “How often do you have the feeling that there’s little meaning in the things you do in your daily life?” Please see Appendix D for the complete measure. The descriptive statistics for this measure are presented in Table 2. The reliability for the Orientation to Life Questionnaire in this sample was .813 and is presented in Table 5.

#### Health Behaviors

Participants were asked to complete a 16 item questionnaire surveying various aspects of lifestyle and health. Items include how often the participant exercises per week, height and weight, and a self-rating of physical health. Higher scores represent worse health behaviors (e.g. smoking, drug use). Please see Appendix E for the complete measure. The descriptive statistics for this measure are presented in Table 2. The reliability of this measure for this sample was .336 and is presented in Table 4. This was the first time this measure had been used.

#### Social Support

Participants were asked to complete the Social Support Questionnaire (SSRQ) (Sarason, Sarason, Shearin, & Pierce, 1987). The SSRQ is a 7 item questionnaire and each item asks participants to list people he or she can count on for various situations and then rate how satisfied he or she is with that support. Items include, “On whom can you count on to console you when you are very upset?” and “Who accepts you totally, including both your worst and best points?” Please see Appendix F for the complete measure. The descriptive statistics for this measure are presented in Table 2. Two scores

are yielded from this questionnaire: social support number (SSN) and satisfaction with social support (SSS). The reliability for the SSN was .940 and the reliability for SSS was .917. Both reliabilities are presented in Table 6.

#### Positive Emotions

Participants were asked to complete the Life Orientation Test (LOT) (Scheier, Carver, & Bridges, 1994) and the Satisfaction with Life Scale (SWLS) (Diener, 1984). The LOT (Scheier et al., 1994) is a 10 item questionnaire and items are rated from 1 (strongly disagree) to 5 (strongly agree) and include “In uncertain times, I usually expect the best” and “I’m always optimistic about my future.” The descriptive statistics for this measure are presented in Table 2. The reliability for the LOT in this sample was .797 and is presented in Table 4. The SWLS (Diener, 1984) is a 5 item questionnaire and items are rated from 1 (strongly disagree) to 5 (strongly agree) and include “In most ways my life is close to my ideal” and “I am satisfied with my life.” Please see Appendices G and H for the complete measures. The descriptive statistics for this measure are presented in Table 2. The reliability for the SWLS (Diener, 1984) in this sample was .873 and is presented in Table 4.

#### Religious Coping

Participants were asked to complete the Brief RCOPE (Pargament, Koenig, & Perez, 2000). The Brief RCOPE (Pargament et al., 2000) is a 14 item questionnaire and items are rated from 1 (not at all) to 3 (a great deal) and include “Focused on Religion to stop worrying about my problems.” Please see Appendix I for the complete measure. The descriptive statistics for these measures are presented in Table 2. This measure yields two scores: positive religious coping and negative religious coping. The reliability for

positive religious coping was .936 for this sample. The reliability for negative religious coping in this sample was .852. Both reliabilities are presented in Table 5.

### Demographics

Participants were asked to complete a demographics section which included age, ethnicity, gender, occupation, how often they attend religious services and their religious affiliation. For the complete demographics section, see Appendix J.

### Procedure

The present study utilized a website specifically designed for facilitating participant recruitment, communication and data collection. The website, acquired through [www.google.com](http://www.google.com), is [www://spiritualityresearch.blogspot.com](http://www://spiritualityresearch.blogspot.com). A link to the online survey was available on this website, as well as the contact information of the principle researcher. The online survey was posted on Opinio, which is a web-based service utilized by Loyola University Chicago. Informed consent was presented to the participants and by clicking the “I Agree” button, participants gave consent to participate in the research. All participant responses were anonymous and confidential. Furthermore, all participants had the ability to opt out of completing the survey at any time.

Advertisements for the study and study descriptions were placed in The Reader, The Chicago Tribune, The Winnetka Talk, The Chicago Sun-Times and on public bulletin boards.

Table 3 Bivariate Correlations for all Measures (a)

	MMS	Affective	Cognitive-Behavioral	Relational-Connective	Ironson-
Woods					
MMS	.909				
Affective	.511**	.961			
Cognitive-Behavioral	.902**	.245**	.936		
Relational-Connective	.630**	.264**	.314**	.881	
Ironson-Woods SR Index	.659**	.400**	.735**	.062	.951
Physical Health	.075	-.025	.020	.195**	-.127
Health Behaviors	.117	-.007	.098	.141*	.023
Life Orientation Test	.194**	.074	.170*	.152*	.139*
Satisfaction with Life Scale	.170*	.267**	.111	.068	.189**
Positive Religious Coping	.550**	.222**	.654**	.041	.748**
Negative Religious Coping	.061	.016	.094	-.038	.136*
Sense of Coherence	.069	.152*	.052	-.018	.102
Social Support Number	.126	.079	.094	.113	.116
Social Support Satisfaction	.096	-.013	.096	.087	.042
Religious Attendance	.385**	.279**	.456**	-.054	.656**

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

Shaded values along the diagonals are Cronbach's Alphas for the respective measures

Table 4 Bivariate Correlations for all Measures (b)

Table 4 Bivariate Correlations for all Measures (b)

MMS	Physical Health	Health Behaviors	Life Orientation Test	Satisfaction with Life Scale
Affective				
Cognitive-Behavioral				
Relational-Connective				
Ironson-Woods SR Index				
Physical Health	.874			
Health Behaviors	.172*	.336		
Life Orientation Test	-.226**	.023	.797	
Satisfaction with Life Scale	-.165*	-.041	.444**	.873
Positive Religious Coping	.066	.162*	.011	.024
Negative Religious Coping	.204**	.039	-.412**	-.374**
Sense of Coherence	-.340**	-.063	.461**	.490**
Social Support Number	-.107	.098	.131	.193**
Social Support Satisfaction	.013	.178**	.197**	.180**
Religious Attendance	-.138*	-.025	.084	.119

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

Shaded values along the diagonals are Cronbach's Alphas for the respective measures

Table 5 Bivariate Correlations for all Measures (c)

MMS	Positive Religious Coping	Negative Religious Coping	Sense of Coherence
Affective			
Cognitive-Behavioral			
Relational-Connective			
Ironson-Woods SR Index			
Physical Health			
Health Behaviors			
Life Orientation Test			
Satisfaction with Life Scale			
Positive Religious Coping	.936		
Negative Religious Coping	.325**	.852	
Sense of Coherence	-.085	-.456**	.813
Social Support Number	.070	-.047	.268**
Social Support Satisfaction	.039	-.075	.149*
Religious Attendance	.560**	.042	.141*

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

Shaded values along the diagonals are Cronbach's Alphas for the respective measures

Table 6 Bivariate Correlations for all Measures (d)

MMS	Social Support Number	Social Support Satisfaction	Religious Attendance
Affective			
Cognitive-Behavioral			
Relational-Connective			
Ironson-Woods SR Index			
Physical Health			
Health Behaviors			
Life Orientation Test			
Satisfaction with Life Scale			
Positive Religious Coping			
Negative Religious Coping			
Sense of Coherence			
Social Support Number	.940		
Social Support Satisfaction	.192**	.917	
Religious Attendance	.125	.010	

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

Shaded values along the diagonals are Cronbach's Alphas for the respective measure

## CHAPTER THREE

### RESULTS

#### **Religious Attendance**

Previous research on religion and health has focused on four dimensions of religion, with religious attendance being the most strongly related to physical health, mental health, and mortality in community based samples (Ellison, 1995; Koenig, George, Cohen, et al., 1998; Koenig et al., 1999). Religious attendance has also been found to be the strongest predictor in the prevention of illness (George et al., 2000). In this current investigation, religious attendance was found to be significantly related to better physical health ( $r(209) = -1.38, p < .05$ , two tailed). In the present sample, the largest percentage of respondents attends religious services more than once a week (26.9%), followed closely by both attending a few times a year (23.7%) and never attending (21.9%). Once a month (5.9%), once a week (7.8%), and once a year (5.9%) accounted for the remaining 25% of participants.

#### **Exploratory Factor Analysis**

Initially, the factorability of the 27 MMS (Reilly & Heath, 2010) items was examined. Several criteria for the factorability were used. The Kaiser-Meyer-Olkin measure of sampling adequacy was .886, above the recommended value of .6. High values (close to 1.00) generally indicate that a factor analysis may be appropriate.

Secondly, Bartlett's Test of Sphericity was significant ( $\chi^2 (351) = 4313.283, p < .000$ ).

This statistic tests the hypothesis that the correlation matrix is an identity matrix, which indicates that the variables are uncorrelated and therefore unsuitable for structure detection. Initially, the extracted communalities were examined and all items with communalities lower than .425 were removed. Please refer to Table 7 for the initial communalities for the original 27 MMS items. The remaining 20 items were then examined with a Maximum Likelihood (ML) Exploratory Factor Analysis.

### **Extraction**

If the data are relatively normally distributed, ML is the best choice for extraction because it allows for the computation of a wide range of indexes of goodness of fit and permits statistical significance testing of the factor loadings (Fabrigar, Wegener, MacCallum, & Strahan, 1999). Fabrigar and colleagues (1999) suggest that one first examine the distributions of the measured variables for normality and unless there are severe problems (e.g. skewness  $> 2$ , kurtosis  $> 7$ ); ML is the appropriate choice for extraction (Fabrigar, et al., 1999). For this sample, skewness and kurtosis statistics for all 27 items were all less than 2 and 7 respectively. Please refer to Table 8 for these statistics. Furthermore, the one-sample Kolmogorov-Smirnow Test was non-significant ( $z (219) = 0.792, p = .557$ , two-tailed), which suggests the test distribution is normal. The one-sample Kolmogorov-Smirnow Test is presented in Table 9. Oblique rotation (Direct Oblim) was utilized as the factors were expected to correlate rather than to be orthogonal.

### **Number of Factors**

The initial analysis extracted four factors that had eigenvalues greater than 1

Table 7 Communalities Complete 27 Item MMS

MMS Item	Initial	Extraction
1	.844	.855
2	.899	.951
3	.864	.879
4	.701	.694
5	.848	.960
6	.823	.822
7	.539	.415
8	.539	.387
9	.589	.533
10	.695	.688
11	.434	.423
12	.740	.738
13	.730	.685
14	.476	.399
15	.255	.139
16	.602	.575
17	.484	.425
18	.439	.362
19	.726	.732
20	.629	.677
21	.621	.851
22	.720	.814
23	.515	.458
24	.563	.570
25	.778	.849
26	.776	.839
27	.536	.482

Table 8 Descriptive Statistics for 27 Item MMS

	Skewness	Kurtosis	Mean	Standard Deviation
SS1	-.575	-.257	3.74	1.06
SS2	-.416	-.360	3.64	1.06
SS3	-.419	-.543	3.63	1.10
SS4	-.364	-.887	3.42	1.24
SS5	-.501	-.535	3.57	1.14
SS6	-.623	-.333	3.66	1.10
SS7	-.061	-.937	3.07	1.26
SS8	-.495	-.721	3.55	1.23
SS9	-.777	-.074	3.84	1.10
SS10	-.423	-.816	3.42	1.28
SS11	.286	-1.227	2.74	1.42
SS12	-.601	-.490	3.64	1.12
SS13	-.392	-.759	3.31	1.23
SS14	-.251	-.886	3.31	1.26
SS15	-.259	-.978	3.21	1.72
SS16	-.580	-.233	3.67	1.08
SS17	-.572	-.567	3.70	1.19
SS18	.065	-1.152	2.87	1.32
SS19	-.678	-.379	3.67	1.19
SS20	-.788	-.511	3.70	1.32
SS21	.148	-1.295	2.86	1.44
SS22	-.786	-.551	3.72	1.31
SS23	-.337	-.737	3.45	1.21
SS24	-.437	-.784	3.46	1.25
SS25	-.337	-.837	3.33	1.27
SS26	-.206	-.953	3.21	1.28
SS27	-.277	-1.020	3.22	1.31
MMS	-.555	.553	56.64	12.15

Table 9 One Sample Kolmogorov-Smirnov Test

N		219
Normal Parameters	Mean	56.6428
	Standard Deviation	12.14972
Most Extreme Differences	Absolute	.054
	Positive	.027
	Negative	-.054
Kolmogorov-Smirnov Z		.792
Asymp. Sig. (2-tailed)		.557
Test distribution is Normal		

(Gorsuch, 1983). These four factors accounted for 74% of the variance. However, currently theorists (e.g. O’Conner, 2000; Fabrigar, et al., 1999) are presenting parallel analysis as a preferable method to identify the number of factors to be extracted. In parallel analysis, the obtained eigenvalues are compared to those one would expect to obtain from random data. If the first  $m$  eigenvalues are those which have values greater than what would be expected from random data, then one adopts a solution with  $m$  factors (Fabrigar et al., 1999). A parallel analysis run for this investigation on 1000 random data sets suggested a three factor solution would best represent the data. The results from the parallel analysis are presented in Table 10.

In addition, examining the scree plot (Cattell, 1966), a three factor solution also seemed arguable. When evaluating a scree plot, one looks for the point where a line drawn through the points changes the slope (Tabachnick & Fidell, 2001). In the scree plot for this analysis, a single line comfortably fits the first three eigenvalues. After that, another line with a noticeably different slope would best fit the remaining points. The scree plot is presented in Figure 1.

A ML factor analysis of the remaining 20 MMS (Reilly & Heath, 2010) items, using oblique rotation (Direct Oblim), was conducted and a three factor solution was forced. In this final three factor solution, the three factors accounted for 73.34% of the variance. The total variance explained by the factors, as well as, the Goodness-of-fit Test for this ML factor analysis are presented in Tables 11 and 12 respectively. A total of 17 items loaded on three factors. Three items loaded on the first factor (values ranged from

Table 10 Parallel Analysis

## Raw Data Eigenvalues, &amp; Mean &amp; Percentile Random Data Eigenvalues

Root	Raw Data	Means	Percentile
1.000000	8.676217	.848329	.972690
2.000000	3.630384	.732754	.816595
3.000000	2.694292	.645770	.717687
4.000000	.977232	.572099	.639407
5.000000	.638957	.507731	.568812
6.000000	.588533	.447721	.504786
7.000000	.456881	.393840	.450781
8.000000	.347916	.339983	.392751
9.000000	.305503	.290800	.339797
10.000000	.156931	.243462	.286910
11.000000	.094883	.199354	.242143
12.000000	.057982	.155873	.201131
13.000000	.043471	.114330	.155535
14.000000	.003212	.074512	.112966
15.000000	-.007149	.034791	.070349
16.000000	-.033208	-.002887	.031816
17.000000	-.044968	-.039816	-.004417
18.000000	-.054784	-.076288	-.045208
19.000000	-.066241	-.111276	-.078329
20.000000	-.067829	-.147013	-.114600
21.000000	-.095146	-.181577	-.150362
22.000000	-.098944	-.215526	-.187997
23.000000	-.120148	-.248815	-.220242
24.000000	-.130976	-.283602	-.258147
25.000000	-.172286	-.318669	-.292671
26.000000	-.185180	-.356533	-.328292
27.000000	-.229602	-.400754	-.365255

Figure 1 Scree Plot

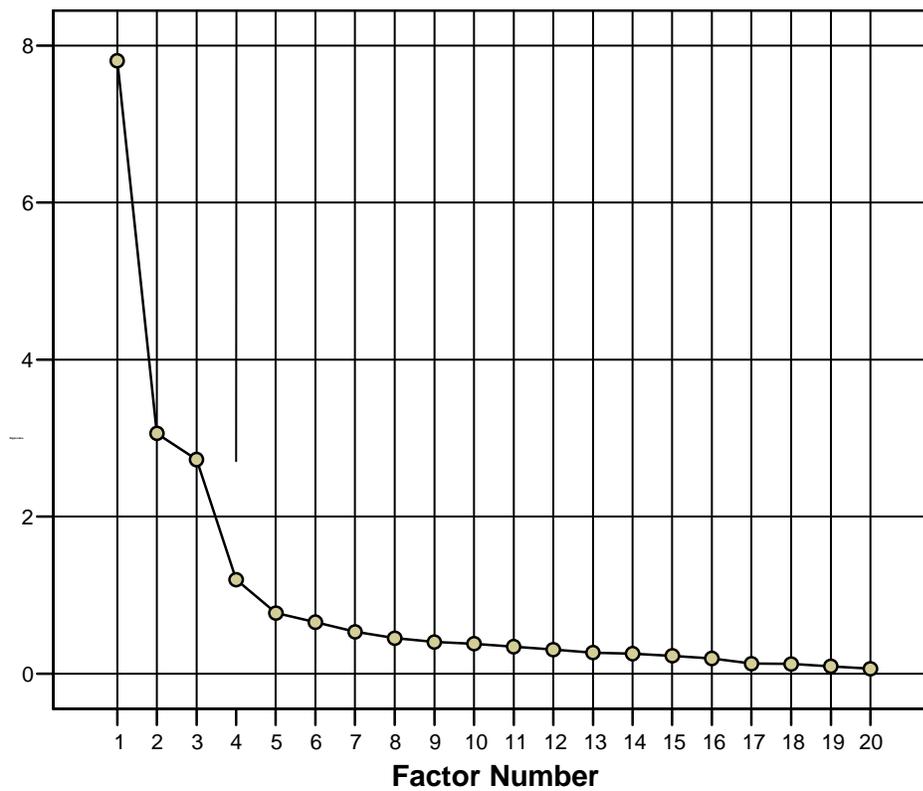


Table 11 Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squares Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	7.257	42.686	42.686	4.767	28.039	28.039	3.153
2	2.879	16.933	59.618	4.628	27.224	55.263	6.505
3	2.333	13.722	73.341	2.276	13.388	68.651	3.564
4	.724	4.260	77.601				
5	.623	3.664	81.265				
6	.511	3.006	84.272				
7	.443	2.609	86.880				
8	.389	2.290	89.170				
9	.356	2.092	91.263				
10	.319	1.876	93.138				
11	.274	1.614	94.752				
12	.243	1.428	96.181				
13	.225	1.325	97.505				
14	.131	.772	98.277				
15	.125	.733	99.011				
16	.101	.596	99.606				
17	.067	.394	100.00				

Table 12 Goodness of Fit Test

Chi-Square	Degrees of Freedom	Significance
253.306	88	.000

.913 to .962), ten items loaded on the second factor (values ranged from .617 to .920) and four items loaded on the third factor (values ranged from .601 to .925). With an oblique rotation, both structure and pattern matrices are provided. It is most often the case with oblique rotation that the pattern matrix is interpreted because it is easier; the difference between high and low loadings is more apparent in the pattern matrix than in the structure matrix (Tabachnick & Fidell, 2001). Along with the pattern matrix, the factor correlations are also presented. The pattern matrix for this final solution is presented in Table 13.

The factor labels originally proposed by Reilly (2006) and Reilly & Heath (2008) in presenting the QFS (Reilly 2010) are applicable to the identified three factor solution: Factor 1: Affective, Factor 2: Cognitive-Behavioral, and Factor 3: Relational-Connective. The dimensions of the QFS (Reilly, 2010) are Affective, Behavioral, Cognitive and Relational-Connective. In this analysis, the Behavioral and Cognitive scales were not separable and collapsed into one factor: Cognitive-Behavioral. In addition, item 22, “Spirituality is my personal relationship with God, or Divine Presence, or unifying force” which was expected to load on Relational-Connective loaded on Cognitive-Behavioral. Statistically, the item is grouped with the cognitive-behavioral items; as such, the item will remain on this factor.

Scale items are presented with loading on the factor to which each item pertains in Table 14. Internal consistency for each of the scales and the overall scale was examined using Cronbach’s alpha. The alphas were quite high - .961 for Affective (3 items), .936 for Cognitive-Behavioral (10 items), and .881 for Relational-Connective (4 items). The alpha for the entire MMS (Reilly & Heath, 2010) was .909. The Cronbach’s alphas for

Table 13 Pattern Matrix

MMS Item	Factor		
	1	2	3
MMS2	.962	-.006	.072
MMS 3	.920	.024	.059
MMS 1	.913	.012	.043
MMS 5	.009	.920	-.119
MMS 6	.025	.899	-.085
MMS 12	.030	.832	.008
MMS 4	.071	.831	-.075
MMS 13	-.061	.809	.071
MMS 10	-.058	.799	.058
MMS 19	-.026	.729	.184
MMS 9	-.011	.656	.149
MMS 22	.158	.617	-.182
MMS 16	-.126	.535	.317
MMS 25	.092	-.108	.925
MMS 26	.023	-.037	.922
MMS 24	.008	.078	.716
MMS 23	.095	.115	.601

Table 14 MMS Scale Items' Factor Loadings

Factor Name	Factor Loading
<b>Factor 1 – Affective</b>	
Spirituality is feeling peaceful	.913
Spirituality is the feeling of serenity	.962
Spirituality is a feeling of calm	.920
<b>Factor 2 – Cognitive-Behavioral</b>	
How I act is a direct result of my spirituality	.831
My spirituality guides my actions	.920
My spirituality impacts how I behave	.899
My spirituality helps me contemplate and understand myself	.656
I think about spirituality frequently	.799
Spirituality has a profound impact on the way that I think	.832
When making a decision, I think about my spiritual beliefs	.809
Pondering spiritual ideas contributes to my own spirituality	.535
I have learned a lot about myself through my own spirituality	.729
Spirituality is my personal relationship with God, or Divine Presence, or unifying force	.617
<b>Factor 3 – Relational-Connective</b>	
Spirituality is the connectedness of the world	.601
Connecting to nature is part of my spirituality	.716
Spirituality is experiencing oneness with the Universe	.925
Spirituality is tapping into the connective force of the Universe	.922

each of the factor subscales of the MMS (Reilly & Heath, 2010) are in Table 3. Total subscale scores were calculated for each of the factors and the factor subscale correlations are also presented in Table 3.

### **Correlations of the Spirituality Scales and Subscales with Physical Health**

Correlation coefficients among three scales; MMS (Reilly & Heath, 2010; Reilly & Heath, 2006, 2008), Ironson-Woods SR Index (Ironson et al., 2002) and Physical Health (Wyler et al., 1986) were computed. The results of the correlational analyses presented in Table 3 show the MMS (Reilly & Heath, 2010) and the Ironson-Woods SR Index (Ironson et al., 2002) were significantly correlated with one another  $r(219) = .659$ ,  $p < .001$ , two tailed. Neither scale of spirituality however was correlated with physical health. This finding was particularly surprising given the abundant literature on the relationship between religion and physical health.

The three factor scales from the MMS (Reilly & Heath, 2010) were then correlated with physical health. To reiterate, high scores on this measure reflect worse physical health. Only one of the three factors from the MMS was correlated with physical health. Higher levels of Relational-Connective were associated with lower levels of physical health  $r(211) = .195$ ,  $p < .001$ , two tailed. The results from the correlations among the three factor scales and physical health are presented in Table 3.

### **Correlations: All Measures**

#### **Spirituality Measures**

The correlations among all the measures used in this study were computed and are

presented in Tables 3-6. The MMS (Reilly & Heath, 2010) was significantly associated with all three of its factor scales Affective ( $r(219)=.511$ ,  $p<.001$ , two-tailed), Cognitive-Behavioral ( $r(219)=.902$ ,  $p<.001$ , two-tailed), and Relational-Connective ( $r(219)=.630$ ,  $p<.001$ , two-tailed). The MMS (Reilly & Heath, 2010) is also significantly associated with religious attendance ( $r(213)=.385$ ,  $p<.001$ , two-tailed), optimism ( $r(219)=.194$ ,  $p<.001$ , two-tailed), satisfaction with life ( $r(219)=.170$ ,  $p<.05$ , two-tailed), and with positive religious coping ( $r(219)=.550$ ,  $p<.001$ , two-tailed).

The Affective factor scale from the MMS (Reilly & Heath, 2010) was significantly associated with the Ironson-Woods SR Index (Ironson et al., 2002) ( $r(219)=.400$ ,  $p<.001$ , two-tailed), the Relational-Connective factor scale ( $r(219)=.264$ ,  $p<.001$ , two-tailed), and the Cognitive-Behavioral factor scale ( $r(219)=.245$ ,  $p<.001$ , two-tailed). The Affective scale is also significantly associated with satisfaction with life ( $r(219)=.267$ ,  $p<.001$ , two-tailed), religious attendance ( $r(213)=.279$ ,  $p<.001$ , two-tailed), positive religious coping ( $r(219)=.222$ ,  $p<.001$ , two-tailed), as well as, sense of coherence ( $r(219)=.152$ ,  $p<.05$ , two-tailed).

The Cognitive-Behavioral factor scale of the MMS (Reilly & Heath, 2010) was significantly associated with the Ironson-Woods SR Index (Ironson et al., 2002) ( $r(219)=.735$ ,  $p<.001$ , two-tailed), the Affective scale from the MMS (Reilly & Heath, 2010) ( $r(219)=.245$ ,  $p<.001$ , two-tailed), the Relational-Connective scale from the MMS (Reilly & Heath, 2010) ( $r(219)=.314$ ,  $p<.001$ , two-tailed), optimism ( $r(219)=.170$ ,  $p<.05$ , two-tailed), religious attendance ( $r(213)=.456$ ,  $p<.001$ , two-tailed), and positive religious coping ( $r(219)=.654$ ,  $p<.001$ , two-tailed).

The Relational-Connective factor scale (Reilly & Heath, 2010) was significantly associated with the Affective (Reilly & Heath, 2010) ( $r(219)=.264$ ,  $p<.001$ , two-tailed) and Cognitive-Behavioral MMS (Reilly & Heath, 2010) scales ( $r(219)=.314$ ,  $p<.001$ , two-tailed), ill physical health (Wyler et al., 1986) ( $r(219)=.195$ ,  $p<.001$ , two-tailed), negative health behaviors ( $r(216)=.141$ ,  $p<.05$ , two-tailed), and optimism ( $r(219)=.152$ ,  $p<.05$ , two-tailed).

In addition to its significant relationship with the MMS(Reilly & Heath, 2010), the Ironson-Woods SR Index (Ironson et al., 2002) was significantly associated with the Affective MMS scale (Reilly & Heath, 2010) ( $r(219)=.400$ ,  $p<.001$ , two-tailed), Cognitive-Behavioral MMS (Reilly & Heath, 2010) scale ( $r(219)=.735$ ,  $p<.001$ , two-tailed), optimism ( $r(219)=.139$ ,  $p<.05$ , two-tailed), satisfaction with life ( $r(219)=.189$ ,  $p<.005$ , two-tailed), religious attendance ( $r(213)=.656$ ,  $p<.001$ , two-tailed), and both positive religious coping ( $r(219)=.748$ ,  $p<.001$ , two-tailed), and negative religious coping ( $r(219)=.136$ ,  $p<.05$ , two-tailed).

#### Health Measures

Physical health (Wyler et al., 1986) was significantly associated with the Relational-Connective MMS scale (Reilly & Heath, 2010) ( $r(219)=.195$ ,  $p<.001$ , two-tailed), negative health behaviors ( $r(216)=.172$ ,  $p<.05$ , two-tailed), optimism ( $r(219)= -.226$ ,  $p<.001$ , two-tailed), satisfaction with life ( $r(219)= -.165$ ,  $p<.05$ , two-tailed), negative religious coping ( $r(219)=.204$ ,  $p<.001$ , two-tailed), and sense of coherence ( $r(219)= -.340$ ,  $p<.001$ , two-tailed).

Negative health behaviors were significantly associated with ill physical health (Wyler et al., 1986) ( $r(216)=.172$ ,  $p<.05$ , two-tailed), the Relational-Connective MMS

scale (Reilly & Heath, 2010) ( $r(216)=.141$ ,  $p<.05$ , two-tailed), positive religious coping ( $r(216)=.162$ ,  $p<.05$ , two-tailed), and satisfaction with social support ( $r(212)=.178$ ,  $p<.001$ , two-tailed).

#### Positive Emotions

Optimism was significantly associated with the MMS (Reilly & Heath, 2010) ( $r(219)=.194$ ,  $p<.001$ , two-tailed), Cognitive-Behavioral MMS scale (Reilly & Heath, 2010) ( $r(219)=.170$ ,  $p<.05$ , two-tailed), Relational-Connective MMS scale (Reilly & Heath, 2010) ( $r(219)=.152$ ,  $p<.05$ , two-tailed), Ironson-Woods SR Index (Ironson et al., 2002) ( $r(219)=.139$ ,  $p<.05$ , two-tailed), life satisfaction ( $r(219)=.444$ ,  $p<.001$ , two-tailed), negative religious coping ( $r(219)= -.412$ ,  $p<.001$ , two-tailed), sense of coherence ( $r(219)=.461$ ,  $p<.001$ , two-tailed), physical health (Wylers et al., 1986) ( $r(215)= -.226$ ,  $p<.001$ , two-tailed), and satisfaction with social support ( $r(215)=.197$ ,  $p<.001$ , two-tailed). Satisfaction with life was significantly associated with the MMS (Reilly & Heath, 2010) ( $r(219)=.170$ ,  $p<.05$ , two-tailed), Affective MMS scale (Reilly & Heath, 2010) ( $r(219)=.267$ ,  $p<.001$ , two-tailed), Ironson-Woods SR Index (Ironson et al., 2002) ( $r(219)=.189$ ,  $p<.005$ , two-tailed), optimism ( $r(219)=.444$ ,  $p<.001$ , two-tailed), negative religious coping ( $r(219)= -.374$ ,  $p<.001$ , two-tailed), sense of coherence ( $r(219)=.490$ ,  $p<.001$ , two-tailed), physical health (Wylers et al., 1986) ( $r(215)= -.165$ ,  $p<.05$ , two-tailed), and both satisfaction with ( $r(215)=.180$ ,  $p<.001$ , two-tailed), and number of social supports ( $r(215)=.193$ ,  $p<.005$ , two-tailed).

### Religious Coping

Positive religious coping was significantly associated with the MMS (Reilly & Heath, 2010) ( $r(219)=.550$ ,  $p<.001$ , two-tailed), Cognitive-Behavioral MMS scale (Reilly & Heath, 2010) ( $r(219)=.654$ ,  $p<.001$ , two-tailed), Affective MMS scale (Reilly & Heath, 2010) ( $r(219)=.222$ ,  $p<.05$ , two-tailed), Ironson-Woods SR Index (Ironson et al., 2002) ( $r(219)=.748$ ,  $p<.001$ , two-tailed), health behaviors ( $r(216)=.162$ ,  $p<.05$ , two-tailed), religious attendance ( $r(213)=.560$ ,  $p<.001$ , two-tailed), and negative religious coping ( $r(219)=.325$ ,  $p<.001$ , two-tailed). Negative religious coping was significantly associated with the Ironson-Woods SR Index (Ironson et al., 2002) ( $r(219)=.136$ ,  $p<.05$ , two-tailed), optimism ( $r(21)= -.412$ ,  $p<.001$ , two-tailed), satisfaction with life ( $r(219)= -.374$ ,  $p<.001$ , two-tailed), positive religious coping ( $r(219)=.325$ ,  $p<.001$ , two-tailed), physical health (Wyler et al., 1986) ( $r(215)=.204$ ,  $p<.001$ , two-tailed), and sense of coherence ( $r(219)= -.456$ ,  $p<.001$ , two-tailed).

### Sense of Coherence

Sense of coherence was significantly associated with both number of ( $r(215)=.268$ ,  $p<.001$ , two-tailed), and satisfaction with social support ( $r(215)=.149$ ,  $p<.05$ , two-tailed), physical health (Wyler et al., 1986) ( $r(215)= -.340$ ,  $p<.001$ , two-tailed), Affective scale of the MMS (Reilly & Heath, 2010) ( $r(219)=.152$ ,  $p<.05$ , two-tailed), optimism ( $r(219)=.461$ ,  $p<.001$ , two-tailed), satisfaction with life ( $r(219)=.490$ ,  $p<.001$ , two-tailed), religious attendance ( $r(213)=.141$ ,  $p<.05$ , two-tailed), and negative religious coping ( $r(219)= -.456$ ,  $p<.001$ , two-tailed).

### Social Support

Number of social supports was significantly associated with satisfaction with life ( $r(219)=.193$ ,  $p<.005$ , two-tailed) and sense of coherence ( $r(215)=.268$ ,  $p<.001$ , two-tailed). Satisfaction with social support was significantly related to health behaviors ( $r(212)=.178$ ,  $p<.009$ , two-tailed), optimism ( $r(215)=.197$ ,  $p<.004$ , two-tailed), satisfaction with life ( $r(215)=.180$ ,  $p<.008$ , two-tailed), and sense of coherence ( $r(215)=.149$ ,  $p<.05$ , two-tailed). Number of and satisfaction with social support were significantly related to one another ( $r(215)=.192$ ,  $p<.005$ , two-tailed).

### Religious Attendance

Religious attendance was significantly associated with the MMS (Reilly & Heath, 2010) ( $r(213)=.385$ ,  $p<.001$ , two-tailed), Ironson-Woods SR Index (Ironson et al., 2002) ( $r(213)=.656$ ,  $p<.001$ , two-tailed), the affective ( $r(213)=.279$ ,  $p<.001$ , two-tailed) and cognitive-behavioral factor scales of the MMS (Reilly & Heath, 2010) ( $r(213)=.456$ ,  $p<.001$ , two-tailed), sense of coherence ( $r(213)=.141$ ,  $p<.05$ , two-tailed), and positive religious coping ( $r(213)=.560$ ,  $p<.001$ , two-tailed).

### Mediation Analyses

A mediational model is supported when four statistical criteria are met: (1) the predictor variable is significantly associated with the criterion outcome variable; (2) the predictor variable is significantly associated with the mediator; (3) the mediator is significantly associated with the outcome variable, after controlling for the predictor; and (4) the previously significant predictor  $\rightarrow$  outcome relationship is significantly diminished

when the effects of the mediator are controlled. These four conditions can be tested with three regression equations (Rose, Holmbeck, Coakley, & Franks, 2004, p.64).

The first step in establishing mediation involved demonstrating that the predictor variable, spirituality was significantly associated with the outcome variable, physical health. The predictor variable and outcome variable were not found to be significantly associated, therefore; there was no effect to mediate and further testing was not deemed necessary. Because two measures of spirituality were included in the investigation, both measures were tested and neither measure was found to be significantly associated with physical health. The results of both of the regression analyses are presented in Table 15 and Table 16.

### **Moderation Analyses**

The tests of mediation revealed spirituality did not significantly associate with physical health. It was then proposed that perhaps the strength and direction of the relationship between spirituality and physical health may depend on the presence or absence of religion. The moderational influences of religious affiliation and religious attendance on the relationship between spirituality and physical health were tested. Religiousness has been shown to have positive effects on one's physical health in the literature (e.g. Oman & Thoresen, 2002) and in this study religiousness attendance was shown to significantly relate to physical health. However, spirituality, which was hypothesized to have a similar relationship to physical health, was not found to be significantly associated with physical health.

Table 15 Bivariate Linear Regression Analysis: MMS and Physical Health

## Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.075	.006	.001	8.68424

Predictors: Spirituality

## ANOVA

Model		Sum of Squares	df	Mean Square	F	Significance
1	Regression	90.097	1	90.097	1.195	.276
	Residual	16063.606	213	75.416		
	Total	16153.702	214			

Predictors: Spirituality

Dependent Variable: Physical Health

## Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Significance
		B	Std. Error	Beta		
1	Constant	7.942	2.893		2.746	.007
	Spirituality	.051	.047	.075	1.093	.276

Dependent Variable: Physical Health

Table 16 Bivariate Linear Regression Analysis: Ironson-Woods SR Index and Physical Health

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.090	.008	.003	10.27339

Predictors: Ironson-Woods

ANOVA

Model		Sum of Squares	df	Mean Square	F	Significance
1	Regression	180.684	1	180.684	1.712	.192
	Residual	22058.387	209	105.543		
	Total	22239.071	210			

Predictors: Ironson-Woods

Dependent Variable: Physical Health

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Significance
		B	Std. Error	Beta		
1	Constant	20.969	3.165		2.746	.000
	IW	-.044	.034	-.090	-1.308	.192

Dependent Variable: Physical Health

It was hypothesized then that spirituality would have no relationship to physical health for those with no religious affiliation but spirituality with a religious affiliation would relate to having better physical health. In addition, it was hypothesized that spirituality would relate to having better physical health for those who attended religious services and that spirituality would have no relationship with physical health for those who did not attend religious services.

To demonstrate a moderational effect using multiple regression (Rose, Holmbeck, Coakley, & Franks, 2004), it is necessary to test the main effects and interaction effects of the predictor variables (i.e. spirituality, religious affiliation, religious attendance) on the dependent variable (physical health). Predictor variables were centered to prevent multicollinearity among the predictors and to allow for proper testing of simple slopes (Rose et al., 2004). In the first test of moderation, the main effects for both predictors (Spirituality and Religious Affiliation) and the interaction were significant. Results are presented in Table 17. In the second moderation, the main effects for both predictors (Spirituality and Religious Attendance) and the interaction term were non-significant. Results are presented in Table 18.

#### Post-Hoc Probing of Significant Moderator Effects

Results for the simple slopes from both regressions are presented in Table 19 and Table 20. The interaction was plotted by creating high and low values of the spirituality variable (centered). These lines were plotted and appear in Figure 2. Using ITALASSI, a macro designed for use with SPSS, two regression lines were created to demonstrate the interaction and are presented in Figures 3 and 4. Figure 3 represents the relationship between spirituality and physical health for those with a religious affiliation and Figure 4

represents the relationship between spirituality and physical health for those with no religious affiliation. The interaction suggests that there is a positive relationship between spirituality and ill physical health for those with no religious affiliation, but no relationship between spirituality and physical health for those with a religious affiliation.

Table 17 Bivariate Linear Regression Analysis: Spirituality and Physical Health  
Moderation: Religious Affiliation

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.069	.005	.000	8.71757
2	.237	.056	.042	8.53049

Predictors: (Constant), spirituality centered

Predictors: (Constant), spirituality centered, religdich, spiritc\_relig

ANOVA

Model		Sum of Squares	df	Mean Square	F	Significance
1	Regression	74.548	1	74.548	.981	.323
	Residual	15807.166	208	75.996		
	Total	15881.714	209			
2	Regression	891.230	3	297.077	4.082	.008
	Residual	14990.484	206	72.769		
	Total	15881.714	209			

Predictors: (Constant), spirituality centered

Predictors: (Constant), spirituality centered, religdich, spiritc\_relig

Dependent Variable: Physical Health

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Significance
		B	Std. Error	Beta		
1	Constant	11.138	.602		18.515	.000
	Spirituality Centered	.047	.047	.069	.990	.323
2	Constant	15.007	1.367		10.975	.000
	Spirituality Centered	.213	.077	.312	2.769	.006
	religdich	-4.528	1.526	-.215	-2.966	.003
	spiritc_relig	-.215	.099	-.235	-2.172	.031

Dependent Variable: Physical Health

Table 18 Bivariate Linear Regression Analysis: Spirituality and Physical Health  
Moderation: Religious Attendance

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.067	.004	.000	8.70705
2	.102	.010	-.004	8.72356

Predictors: (Constant), spirituality centered

Predictors: (Constant), spirituality centered, attenddich, spiritc\_attend

ANOVA

Model		Sum of Squares	df	Mean Square	F	Significance
1	Regression	70.025	1	70.025	.924	.338
	Residual	15693.248	207	75.813		
	Total	15763.273	208			
2	Regression	162.667	3	54.222	.713	.546
	Residual	156000.606	205	76.101		
	Total	15763.273	208			

Predictors: (Constant), spirituality centered

Predictors: (Constant), spirituality centered, attenddich, spiritc\_attend

Dependent Variable: Physical Health

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Significance
		B	Std. Error	Beta		
1	Constant	11.087	.602		18.409	.000
	Spirituality Centered	.045	.047	.067	.961	.338
2	Constant	12.126	1.453		8.345	.000
	Spirituality Centered	.129	.090	.189	1.428	.155
	attenddich	-1.102	1.610	-.052	-.685	.494
	spiritc_attend	-.111	.108	-.130	-1.028	.305

Dependent Variable: Physical Health

Table 19 Bivariate Linear Regression Analysis: Spirituality and Physical Health  
Moderation: Post-Hoc Probing, Religious Yes

## ANOVA

Model		Sum of Squares	df	Mean Square	F	Significance
1	Regression	891.230	3	297.077	4.082	.008
	Residual	14990.484	206	72.769		
	Total	15881.714	209			

Predictors: (Constant), sp\_religyes, religyes, spirituality centered

Dependent Variable: Physical Health

## Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Significance
		B	Std. Error	Beta		
1	Constant	15.007	1.367		10.975	.000
	Spirituality Centered	.213	.077	.312	2.769	.006
	religyes	-4.528	1.526	-.215	-2.966	.003
	sp_religyes	-.215	.099	-.235	-2.172	.031

Dependent Variable: Physical Health

Table 20 Bivariate Linear Regression Analysis: Spirituality and Physical Health  
Moderation: Post-Hoc Probing, Religious No

## ANOVA

Model		Sum of Squares	df	Mean Square	F	Significance
1	Regression	891.230	3	297.077	4.082	.008
	Residual	14990.484	206	72.769		
	Total	15881.714	209			

Predictors: (Constant), sp\_religno, religno, spirituality centered

Dependent Variable: Physical Health

## Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Significance
		B	Std. Error	Beta		
1	Constant	10.479	.679		15.443	.000
	Spirituality Centered	-.002	.062	-.003	-.028	.978
	religno	-4.528	1.526	-.215	-2.966	.003
	sp_religno	-.215	.099	-.202	-2.172	.031

Dependent Variable: Physical Health

Figure 2 Interaction: Spirituality and Ill Physical Health as Moderated by Religious Affiliation

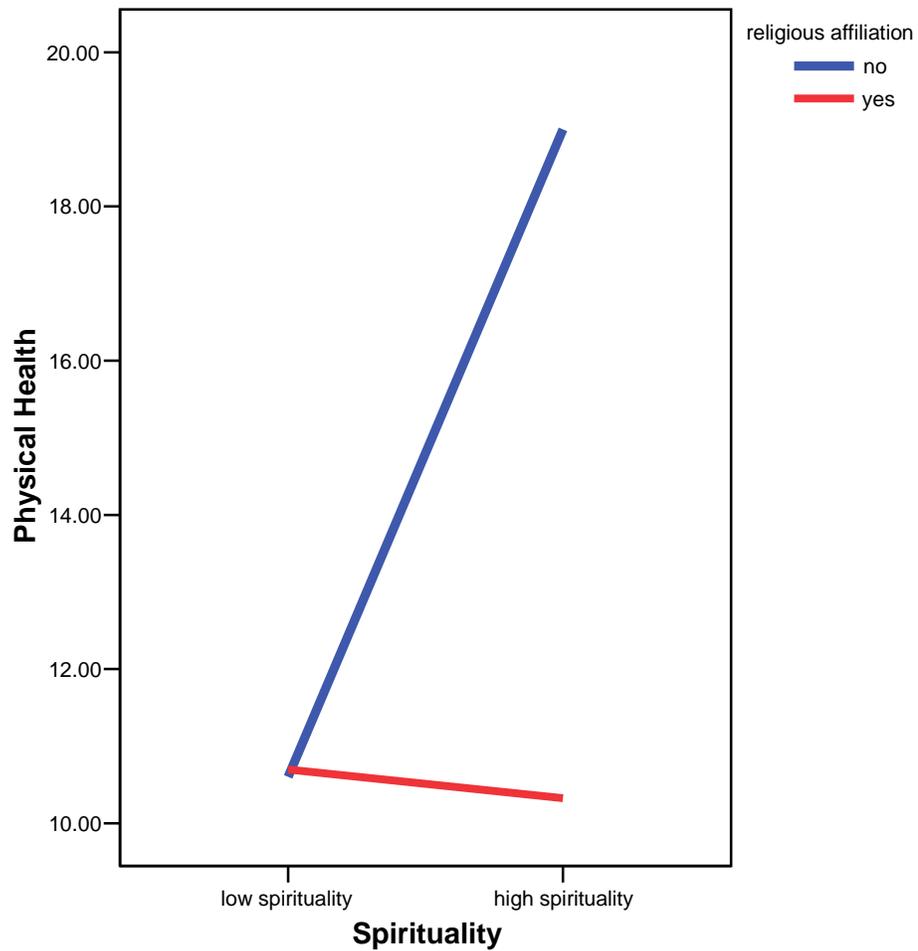


Figure 3 Relationship between Spirituality and Ill Physical Health when Religious Affiliation is Equal to 1 (Religious Affiliation)

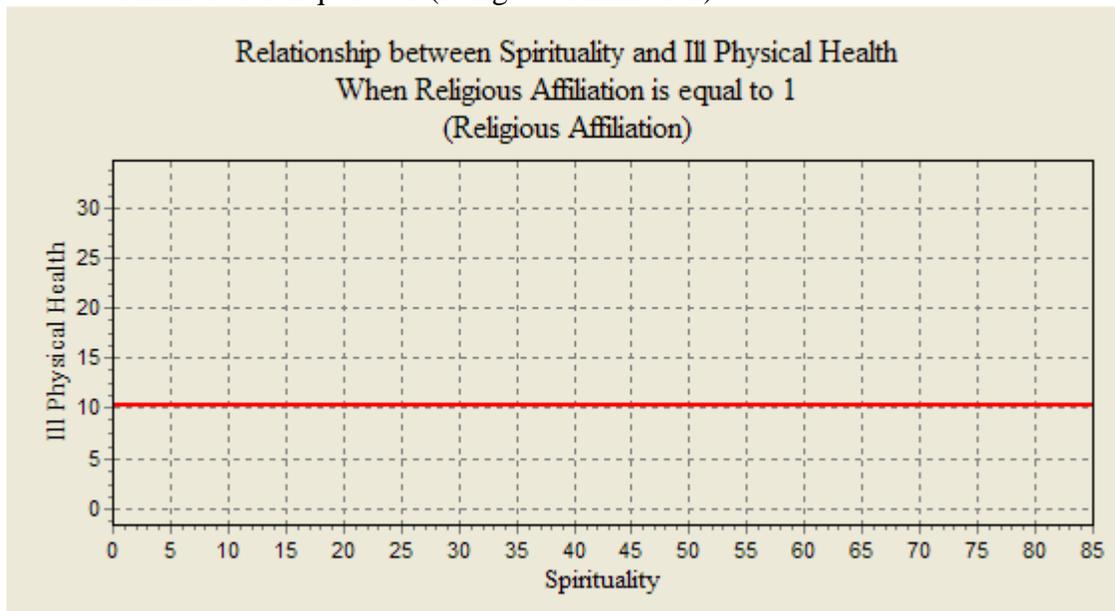
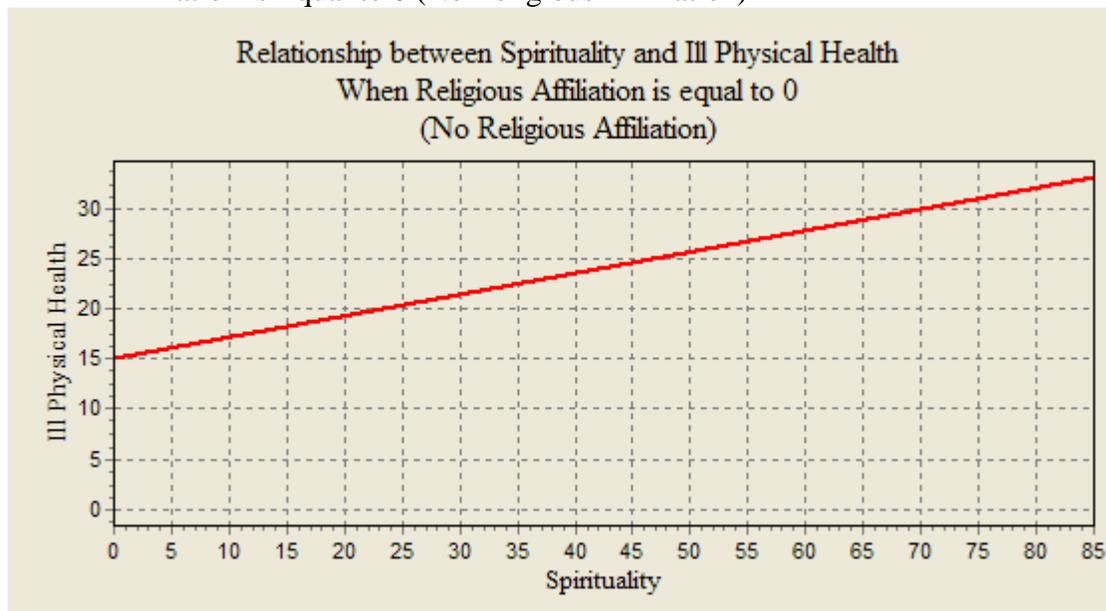


Figure 4 Relationship between Spirituality and Ill Physical Health when Religious Affiliation is Equal to 0 (No Religious Affiliation)



## CHAPTER FOUR

### DISCUSSION

Overall, our results suggest that the relationship between spirituality and physical health is more complicated than previously hypothesized. Opposed to the relatively straightforward relationship between religion and physical health, spirituality, and its role in physical health, proves to be more of a challenge to understand. At the outset, this study had 8 main hypotheses and 2 main goals. The first goal was to identify a factor structure and ultimately further develop and hone a multidimensional scale of spirituality. The factor analysis was a success and a theory driven, three-factor structure was identified. This three-factor structure fits with the theoretical foundation of the QFS (Reilly, 2010; Reilly & Heath, 2006, 2008). The remaining hypotheses were derived from the second main goal; to identify the mediators of the relationship between spirituality and physical health. Surprisingly, spirituality was not found to be significantly associated with physical health. As such, these tests of mediation could not be pursued. What followed was a series of statistical tests that help to shed light on this relatively new area of spirituality and physical health. The results discovered stand to significantly inform the very complex construct of spirituality and its intricate relationship to physical health and other variables of interest.

## Factor Analysis

The results from the factor analysis lend further support to the theory that spirituality is multidimensional (Paloutzian & Park, 2005). The three identified factors take root in the QFS (Reilly, 2010; Reilly & Heath, 2006, 2008). Again, the framework posits that spirituality has four main dimensions – Affective, Behavioral, Cognitive and Relational-Connective. However, after the current investigation, two of factors, cognitive and behavioral collapsed into one factor, renamed Cognitive-Behavioral. Despite this, the QFS (Reilly, 2010) remains conceptually pertinent; it is useful to view the four factors independently to guide research and to further investigate the area of spirituality.

As the QFS (Reilly, 2010) took root in the tripartite theory of attitudes, it became of interest, following these results, to investigate whether or not the tripartite conceptualization holds up in empirical investigations. It seems that oftentimes, cognitive, affective and behavioral responses are not discernible as three classes in empirical investigations (Fishbein, 1967; Fishbein & Ajzen, 1974). However, Eagly and Chaiken (1993) argue that despite whether the types prove distinguishable in proper statistical analyses, the tripartite distinction provides an important theoretical framework and continues to provide the field with fitting language for thinking about attitudinal responding. Likewise, it is argued that even though the four factors were not entirely separable in the ML factor analysis, the QFS (Reilly, 2010) still proves to be quite useful as a conceptual framework for understanding spirituality and for guiding research.

Despite the identification of only three factors, the factor labels have all been retained from the QFS (Reilly, 2010): Affective, Cognitive-Behavioral, and Relational-Connective. This three factor solution accounted for 73% of the variance, which is

indicative of a good fit for the data. These three factors do appear to capture spirituality and what it is to be spiritual. Within the QFS (Reilly, 2010), spirituality is not being reduced to simply a belief, or an emotion or an action, or a relationship or connection; instead it is the sum of all of these dimensions taken together.

The factor analysis had another purpose; that of scale development. From this investigation, the MMS (Reilly & Heath, 2010) has been refined. The MMS (Reilly & Heath, 2010), has a three factor structure and has an overall alpha and factor scale alphas that are considered to by Robinson, Shaver, and Wrightsman (1991) to be “exemplary” (p.12). Further support for this scale was provided by the significant correlation between the MMS (Reilly & Heath, 2010) and the Ironson-Woods SR Index (2002) (see Table 3). Correlations between the three factors of the MMS (Reilly & Heath, 2010) and the four factors presented by Ironson-Woods were planned but the four factor solution described by Ironson-Woods (2002) was not replicated in our data. A PAF was run with varimax rotation and a five factor solution was produced. However, multiple items had very high cross-loading items on other factors (e.g. values averaging .7). Analysis was stopped at that point.

The application of the MMS (Reilly & Heath, 2010) to the study of spirituality, religion and health seems very promising. Not only does the MMS (Reilly & Heath, 2010) conceptualize spirituality as multidimensional, it offers three factor scales for investigating the many complex relationships spirituality may have with other psychological variables. Furthermore, this scale measures spirituality and not

spirituality/religion. In addition, it assesses both the public and private aspects of spirituality; the emotional, the intellectual, and the experiential dimensions of spirituality together. Using this measure of spirituality, areas that have not yet been explored within this field could be taken on with confidence. George and colleagues (2002) point out that there surprisingly, has been no examination of the effects of personality traits on religious participation. Given this, it is doubtful that this area has been pursued with spirituality. The three factor scales of the MMS (Reilly & Heath, 2010) give this measure an advantage with applicability to a wide range of psychological constructs and phenomena to furthering the knowledge of spirituality.

### **Correlations: Spirituality and Physical Health**

The results from the correlations between the MMS (Reilly & Heath, 2010), Ironson-Woods SR Index (2002) and Physical Health (Wylers, 1986) suggest that spirituality has no statistically significant relationship to physical health. As such, a main hypothesis was not supported for this sample. An important implication from this finding is that spirituality and religion, as psychological constructs, will not always have analogous relationships with other variables. This finding sets a cautionary tone. More often than not in this literature, authors and investigators use spirituality and religion interchangeably. In this investigation, this correlation demonstrated there is good reason to refrain from this dangerous and misleading pairing.

A reason that this finding is so surprising is that it goes against the trend in the literature. For years, the finding that religion relates positively to physical health has been presented again and again (e.g. Oman & Thoresen, 2002; Keonig et al., 1998).

Spirituality, although newer to the focus of investigations, may have just been assumed to

relate to physical health given its conceptual similarity to religion. To the author's knowledge, this is the first investigation to test the relationship between spirituality and physical health cleanly. Other studies have used spirituality as "spirituality/religion" or used the two concepts interchangeably (George et al., 2000). By acting in this manner, the results cannot be purely attributed to spirituality.

Although religiosity was not a primary focus of this investigation, two single item measures of religious attendance and religious affiliation were included in the Demographics section. Given the lack of relationship between spirituality and physical health, it was decided it would be prudent to attempt to verify the well established relationship between physical health and religion with our sample. The finding that religious attendance significantly relates to physical health (George et al, 2002) was in fact replicated in our study.

In hopes of further understanding the relationship between spirituality and physical health, the three factor scales from the MMS (Reilly & Heath, 2010) were correlated with physical health. Only the Relational-Connective factor had a significant relationship with physical health. The higher individuals are on the Relational-Connective factor, the worse their physical health. It could be that for those high on the Relational-Connective factor, their focus is on others and relating and connecting and not on the self. Their health may be of peripheral importance. Alternatively, it could be that those who are ill are seeing out connections and relationships with others spiritually.

### Correlations: All Measures

All physical health and negative health behaviors were found to significantly associate with one another. This correlation was expected. The MMS (Reilly & Heath, 2010), its three factor scales and the Ironson-Woods SR Index (Ironson et al., 2002) were all very highly correlated with one another. This makes sense given the purposes of these scales. Although there are findings in the literature concerning religiosity or religious involvement to the proposed mediators (e.g. positive emotions, religious coping, health behaviors, social support, religious attendance and sense of coherence) investigated in this study, the relationship among these variables with spirituality is not well known. To the author's knowledge, this not only the first study to examine the relationship between spirituality and these proposed mediators, but this is also the first study to do so concurrently. Despite the lack of statistical evidence that these variables mediate of the relationship between spirituality and physical health, there is still much to learn about how these variables relate to one another.

The MMS (Reilly & Heath, 2010) was found to be significantly related to the two measures of positive emotions, the LOT (Scheier et al., 1994) and SWLS (Diener, 1984), measuring optimism and life satisfaction respectively. As Robert Emmons (2005) shockingly presents in the *Handbook of Religion and Spirituality*, a literature search returned 2,875 citations for the term religion and 5,116 for emotion and only five for both (p.235). At this time, research examining the relationship between spirituality and positive emotionality is at best scant.

However, it makes sense theoretically that these two scales would be correlated with not only the MMS (Reilly & Heath, 2010) but the Ironson-Woods SR Index

(Ironson et al., 2002) as well. Spirituality, like religion, can most definitely lead to positive emotional states. Just as there are religious practices and experiences that conjure up positive emotional states, spiritual practices and experiences are likely to do so as well. Furthermore, being spiritual, like being religious, may offer to individuals different ways of perceiving events, people and places. For example, “gratitude, awe and reverence, love and hope are likely to be generated when people perceive sacredness in various aspects of their lives” (Emmons, p. 239, 2005).

As the LOT (Scheier et al., 1994) and SWLS (Diener, 1984) measure specific emotions, our discussion now turns in this direction. The SWLS (Diener, 1984) examines individuals’ satisfaction with life. McCullough and colleagues (2001) present a summary of findings that suggest persons with high well-being and life satisfaction are often healthy and active, have plenty of social support, a strong sense of purpose and meaning and were hopeful and optimistic (McCullough et al., 2001). Examining these relationships in a religious context, it was found that in the vast majority of studies examined, 80% religious involvement was positively correlated with greater well-being, greater happiness, life satisfaction, morale and hope (McCullough et al., 2001). In the current investigation, in addition to spirituality, the SWLS (Diener, 1984) was found to significantly relate to better physical health, optimism, to less negative religious coping, number of social supports and satisfaction with social support.

The LOT (Scheier et al., 1994) measures how optimistic people are in their lives. Optimism, religion and hope have been found to be significantly and positively correlated

in numerous studies (McCullough et al., 2001). Optimism is thought to be a health-relevant personality trait such that optimism has been shown to predict both mental and physical health (McCullough et al., 2001). In this investigation, optimism was found to significantly relate to better physical health, greater satisfaction with life, a sense of coherence, satisfaction with social support and less use of negative religious coping.

The Brief RCOPE (Pargament et al., 2000) was utilized in this investigation and yields two scores: a positive religious coping score and negative religious coping score. Positive religious coping was found to significantly relate to the MMS (Reilly & Heath, 2010), affective and cognitive-behavioral scales of the MMS (Reilly & Heath, 2010), Ironson-Woods SR Index (Ironson et al., 2002), negative health behaviors, and the negative religious coping scale. In research summarized by the scale's creator, positive religious coping has been found to significantly relate to less depression and better quality of life (Pargament, 2003).

Negative religious coping has been found to relate to poor health, increased distress, greater depression and lower quality of life (Pargament, 2003). In the present investigation, similar results were found. Negative religious coping was found to be significantly associated with the Ironson-Woods SR Index (Ironson et al., 2002), worse physical health, less optimism, and less satisfaction with life.

Pargament (2003) also states that both positive and negative religious coping result in spiritual growth. In the current investigation, positive religious coping was significantly associated with the MMS (Reilly & Heath, 2010) and negative religious coping was significantly associated with the Ironson-Woods SR Index (Ironson et al., 2002).

Sense of coherence was found to significantly relate to the affective scale of the MMS (Reilly & Heath, 2010), better physical health, optimism, satisfaction with life, with less negative religious coping, and with both number of and satisfaction with social support. In the literature, sense of coherence has been found to be significantly associated with physical and psychological well-being as well as the use of adaptive coping strategies (e.g. Antonovsky, 1992; Pallant & Lae, 2002). Although a strong sense of coherence may lead to an individual feeling more positive and satisfied with their lives, an equally plausible argument may be that people who feel good about themselves and their lives may report higher levels of coherence.

In this investigation, the Social Support Questionnaire (Sarason, et al., 1983) was utilized and two scores are given: number of and satisfaction with social support. Social support number was found to be significantly associated with satisfaction with life, sense of coherence and satisfaction with social support. Satisfaction with social support was also found to relate to satisfaction with life and sense of coherence. However, satisfaction with social support additionally significantly related to negative health behaviors and optimism. These findings from the current investigation are supported by previous research with this measure that has found individuals with high number of social supporters and high levels of satisfaction with that support to have positive self-concepts, be low in anxiety, have a more optimistic view of life and have a belief in their abilities to control aspects of their environments (Sarason, et al., 1983).

Religious attendance was found to significantly associate with sense of coherence,

positive religious coping, both measures of spirituality and the affective and cognitive-behavioral scales of the MMS (Reilly & Heath, 2010; Ironson et al., 2002). Sense of coherence, to the author's knowledge, and its relationship to religious attendance has not been examined.

However, that having a sense of coherence is related to attending religious services is not surprising given that as the more one attends, the more exposure one has to that specific world view, which enables them to find meaning in events and major life events. Furthermore, the more one attends, the more likely it is that positive religious coping is utilized. These strategies include seeking God's comfort and care and trusted in God, seeking spiritual support and finding meaning. That religious attendance and spirituality are significantly related is not surprising given the replicable finding that the majority of respondents identify themselves as both spiritual and religious (e.g. Corrigan, McCorkle, Schell, & Kidder, 2003; Shahabi et al., 2002; Zinnbauer, et al., 1997).

### **Mediation and Moderation**

The greatest surprise from this investigation was the non-significant spirituality-physical health relationship. Spirituality has been touted in the literature for many years as being a challenge to conceptualize and study. It also appears that in addition to definitional challenges, spirituality and its relationship with other variables may also be less straightforward.

Along with the significant correlation between physical health and religious attendance, the non-significant results for possible mediation suggested that perhaps religion could be acting as a moderator in the relationship between spirituality and physical health. As there was no measure of religiosity included in this investigation,

religious attendance and religious affiliation seemed to fit theoretically as moderators to be tested. Both variables were transformed into dichotomous variables to represent those not affiliated with a religion (22%) and those affiliated (78%); and those who do not attend services (22%) and those who do attend services (78%).

The results indicated religious affiliation but not religious attendance moderated the relationship between spirituality and physical health. This finding is interesting because it goes against the main findings in the literature that religious attendance is the variable with the strongest relationship to physical health. Furthermore, the fact that simply being affiliated with a particular religion moderates the relationship between spirituality and physical health is very unexpected.

In order to further our understanding of the moderator's influence, post-hoc probing was conducted. After plotting the interaction, the relationship became clearer and was even more unanticipated. The interaction suggests that there is a positive relationship between spirituality and ill physical health for those with no religious affiliation, but no relationship between spirituality and physical health for those with a religious affiliation. One could argue that those individuals who have the lowest levels of physical health have the highest levels of spirituality because this area of their lives has become more salient during their sickness; spirituality is more of a central focus for them in coping with their physical health.

For individuals with a religious affiliation, in sickness and in health, their religion is there for them; they need not turn to spirituality. Those without a religious affiliation, it

could be argued, turn to spirituality when they become ill. They do not benefit from the protective factor of religious affiliation. It could also be that those without a religious affiliation who are highly spiritual are ill more often because these individuals lack the protective benefit of social support one gains through a religious affiliation (e.g. Ellison, 1998; George et al., 2000; Powell et al., 2003). More often than not, spirituality is something deemed personal and is something sought on one's own. It could be through this pathway that physical health and spirituality are related.

### **Limitations**

There are a number of limitations to this study. First, there was no measure of religiosity included in this study. The primary focus of this investigation was to explore the relationship between spirituality and physical health and there was no immediate concern with religion. However, given the results found in this study, it would have been prudent to include a measure of religiosity that went beyond single questions inquiring after religious affiliation and attendance. In this vein, it was unfortunate that Muslim was not included as a choice for Religious Affiliation. In future investigations, it would be prudent to include a measure assessing whether one is spiritual and religious, spiritual but not religious, religious but not spiritual or neither spiritual nor religious to specifically address the interplay between spirituality and religion.

Another limitation of this study is that cross-sectional data do not lend themselves to statements about causality. In addition, in measuring physical health, all questions were assessed in a retrospective manner. Retrospective reporting is subject to obvious

possible biases as subsequent events may shape the memory of the participants. Also, the measure of physical health used did not include any serious or long-term illnesses or conditions such as heart disease, cancer, high blood pressure, high cholesterol, chronic pain, number of heart attacks, HIV/AIDS, arthritis, stroke and/or diabetes. Conditions and illnesses such as these may have differential relationships to spirituality than do the colds, fevers, allergies, stomach aches and flu that were assessed in this study.

Another limitation regarding physical health in addition to the type of symptomology assessed, was that this population based sample was on the healthy side. The physical health measure used has a response range of 0-75 and the maximum score found in this sample was 53. The lack of relationship between spirituality and physical health could be a result of the healthy nature of this sample.

### **Conclusions**

The main criticisms on this area have included not having sound measures (George et al., 2000) and that there is a need to conceptualize spirituality as a multidimensional construct (Miller & Thoresen, 2003). With solid psychometrics, an empirically strong factor structure, and grounded in theory, the MMS (Reilly & Heath, 2010) stands to provide the field with a strong measurement scale for further analysis and study of spirituality. With the MMS (Reilly & Heath, 2010) comes the QFS (Reilly, 2010), a multidimensional framework, which offers the field of religion, spirituality and physical health an important theoretical framework that can aid in the evolution of a shared understanding of spirituality as a psychological construct.

Taken together, these results greatly inform the area of spirituality, religion and physical health. There has been no investigation with a focus on taking the relationship that exists between physical health and religion and investigating whether the same holds true for spirituality. It does not. This study sheds light on a dangerous tendency in the field: assuming that spirituality acts like religion. Spirituality and religion are both very important to a great number of individuals and are often considered to be very special and sacred parts of our lives. The numerous ways in which religion and spirituality can affect individuals remains to be seen. The interplay between the two may have important implications for health research, as well as how these factors may influence judgments, behaviors and life experiences. It is a very exciting time in this area of research because the focus on spirituality is so new and there is still much to discover.

APPENDIX A  
MULTIDIMENSIONAL MEASURE OF SPIRITUALITY

**Spirituality Scale** – Using the following scale, please rate the degree to which you disagree or agree to the following statements concerning your spirituality.

- | Strongly Disagree        | Neither Disagree nor Agree | Strongly Agree |                          |  |
|--------------------------|----------------------------|----------------|--------------------------|--|
| 1                        | 2                          | 3              |                          |  |
| 4                        | 5                          |                |                          |  |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | Spirituality is feeling peaceful   |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | Spirituality is the feeling of serenity  |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | Spirituality is a feeling of calm  |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | How I act is a direct result of my spirituality  |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | My spirituality guides my actions  |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | My spirituality impacts how I behave   |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | Spirituality is when one acts selflessly   |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | Spirituality is evident when one acts morally  |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | My spirituality helps me contemplate and understand myself                                     |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | I think about spirituality frequently  |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | My spirituality is different from my religion  |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | Spirituality has a profound impact on the way that I think                                     |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | When making a decision, I think about my spiritual beliefs                                     |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | My spirituality involves asking many questions   |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | I sometimes question my spiritual beliefs  |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | Pondering spiritual ideas contributes to my own spirituality                                   |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | Learning about other religious and spiritual traditions has enriched my spirituality           |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | I often seek out information about different religious, non-religious, and/or spiritual groups |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | I have learned a lot about myself through my own spirituality                                  |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | Spirituality is belief in God, or Divine Presence, or unifying force                           |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | My spirituality is the same thing as my religion   |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | Spirituality is my personal relationship with God, or Divine Presence, or unifying force       |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | Spirituality is the connectedness of the world   |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | Connecting to nature is a part of my spirituality  |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | Spirituality is experiencing oneness with the Universe   |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | Spirituality is tapping into the connective force of the Universe                              |
| <input type="checkbox"/> |                            |                | <input type="checkbox"/> | I believe that spirituality and religion are similar concepts                                  |

APPENDIX B  
IRONSON-WOODS SPIRITUALITY/RELIGION INDEX



APPENDIX C  
SYMPTOM CHECKLIST

## Symptom Checklist

Below is a list of common medical conditions or illnesses. Please indicate the extent to which you have experienced each symptom or problem during the PAST FOUR WEEKS. Please use the following scale.

- 0) I have not experienced this symptom or illness at all
- 1) I have experienced this symptom or illness only rarely or have had only slight symptoms.
- 2) I have experienced this symptom or illness on several occasions or have had relatively intense symptoms on one or two occasions.
- 3) I have had serious problems with this symptom or illness - either very severe symptoms, very frequent symptoms, or both.

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> 1. common cold            | <input type="checkbox"/> 11. insomnia (trouble sleeping) | <input type="checkbox"/> 21. eye infection |
| <input type="checkbox"/> 2. sore throat            | <input type="checkbox"/> 12. heartburn/indigestion       | <input type="checkbox"/> 22. ear infection |
| <input type="checkbox"/> 3. headache               | <input type="checkbox"/> 13. skin problems(e.g., acne)   | <input type="checkbox"/> 23. chest pain    |
| <input type="checkbox"/> 4. toothache              | <input type="checkbox"/> 14. sweating or chilling        | <input type="checkbox"/> 24. bronchitis    |
| <input type="checkbox"/> 5. backache               | <input type="checkbox"/> 15. stomach ache                | <input type="checkbox"/> 25. pneumonia     |
| <input type="checkbox"/> 6. loss of appetite       | <input type="checkbox"/> 16. flu or "bug"                |  |
| <input type="checkbox"/> 7. bladder infection      | <input type="checkbox"/> 17. dizziness                   |  |
| <input type="checkbox"/> 8. cold sore, canker sore | <input type="checkbox"/> 18. nausea                      |  |
| <input type="checkbox"/> 9. constipation           | <input type="checkbox"/> 19. fatigue                     |  |
| <input type="checkbox"/> 10. diarrhea              | <input type="checkbox"/> 20. allergies                   |  |

During the **past 4 weeks**, how many trips did you make to a **doctor's office, emergency room, or student health center** to receive treatment for an illness?

Please enter a number \_\_\_\_\_.

APPENDIX D  
ORIENTATION TO LIFE QUESTIONNAIRE

**Orientation to Life Questionnaire** – please circle your response and notice that the rating scales differ with each question.

1. Has it happened in the past that you were surprised by the behavior of people whom you thought you knew well?  
 Never Happened Always Happened  
 1            2            3            4            5            6            7
  
2. Do you have the feeling that you are in an unfamiliar situation and don't know what to do?  
 Very Often Very Seldom or Never  
 1            2            3            4            5            6            7
  
3. Do you have very mixed-up feelings and ideas?  
 Very Often Very Seldom or Never  
 1            2            3            4            5            6            7
  
4. How often does it happen that you have feelings inside you that you would rather not feel?  
 Very Often Very Seldom or Never  
 1            2            3            4            5            6            7
  
5. When something happened, you have generally found that  
 You overestimated or You saw things in the right  
 underestimated its importance proportion  
 1            2            3            4            5            6            7
  
6. Has it happened that people whom you counted on disappointed you?  
 Never Happened Always Happened  
 1            2            3            4            5            6            7
  
7. Do you have the feeling that you are being treated fairly?  
 Very Often Very Seldom or Never  
 1            2            3            4            5            6            7
  
8. Many people, even those with a strong character, sometimes feel like losers in certain situations. How often have you felt this way in the past?  
 Never Very Often  
 1            2            3            4            5            6            7
  
9. How often do you have feelings that you're not sure you can keep under control?  
 Very Often Very Seldom or Never  
 1            2            3            4            5            6            7

10. Do you have the feeling that you don't really care about what goes on around you?

Very Seldom or Never				Very Often		
1	2	3	4	5	6	7

11. Until now, your life has had

No clear goals or purpose at all				Very clear goals and purpose		
1	2	3	4	5	6	7

12. Doing the things you do every day

A source of deep pleasure and satisfaction				A source of pain and boredom		
1	2	3	4	5	6	7

13. How often do you have the feeling that there's little meaning in the things you do in your daily life?

Very Often				Very Seldom or Never		
1	2	3	4	5	6	7

APPENDIX E  
HEALTH BEHAVIORS

Health Behaviors – please notice that the rating scales differ with each question

1. How would you rate your physical health?
  - a. Excellent
  - b. Very good
  - c. Good-fair
  - d. Poor
  - e. Very Poor
2. During the last year, how often did you visit your doctor or emergency room? (excluding physical)
3. How often do you exercise a week?
  - a. 1-2
  - b. 3-4
  - c. 5-6
  - d. Everyday
4. Which activities do you engage in for exercise during the week?
  - a. Swimming
  - b. Walking
  - c. Jogging
  - d. Running
  - e. Aerobics
  - f. Yoga/Pilates
  - g. Elliptical
  - h. Bicycling
  - i. Weight Lifting
  - j. Activity not listed
5. Have you ever been diagnosed with high blood pressure? Yes/No
6. How you ever been diagnosed with high cholesterol? Yes/No
7. How you experienced a heart attack? Yes/No
8. Do you have insomnia? Yes/No
9. In an average week, how many alcoholic beverages do you consume?
  - a. 0
  - b. 1-2
  - c. 3-4
  - d. 5-6
  - e. 7 or more
10. Do you smoke?
  - a. Yes
  - b. No
11. If you smoke, how many cigarettes do you smoke daily?
  - a. 1-5
  - b. 5-10
  - c. 10-15

- d. 15-20
  - e. More than 20
12. How often did you take illegal drugs during the past month? (e.g. marijuana, cocaine, methamphetamine, etc)
- a. I do not take illegal drugs
  - b. 1-5
  - c. 5-10
  - d. 10-15
  - e. 15-20
  - f. More than 20 times during the last month
13. Do you experience chronic pain?
14. If so, what type of chronic pain do you experience?
15. What is your height?
16. What is your weight?

APPENDIX F  
SOCIAL SUPPORT QUESTIONNAIRE





APPENDIX G  
LIFE ORIENTATION TEST

Life Orientation Test – using the following scale, please rate the degree to which you agree with the following statements.

Strongly Disagree                      Neither Disagree nor Agree                      Strongly Agree  
1                      2                      3                      4                      5

- \_\_\_\_\_ In uncertain times, I usually expect the best
- \_\_\_\_\_ It's easy for me to relax
- \_\_\_\_\_ If something can go wrong for me, it will
- \_\_\_\_\_ I'm always optimistic about my future
- \_\_\_\_\_ I enjoy my friends a lot
- \_\_\_\_\_ It's important for me to keep busy
- \_\_\_\_\_ I hardly ever expect things to go my way
- \_\_\_\_\_ I don't get upset too easily
- \_\_\_\_\_ I rarely count on good things happening to me
- \_\_\_\_\_ Overall, I expect more good things to happen to me than bad

APPENDIX H  
SATISFACTION WITH LIFE SCALE

Satisfaction with Life Scale – using the following scale, please rate the degree to which you agree with the following statements.

Strongly Disagree                      Neither Disagree nor Agree                      Strongly Agree  
1                      2                      4                      6                      7

- \_\_\_\_\_ In most ways, my life is close to my ideal
- \_\_\_\_\_ The conditions of my life are excellent
- \_\_\_\_\_ I am satisfied with my life
- \_\_\_\_\_ So far I have gotten the important things I want in life
- \_\_\_\_\_ If I could live my life over, I would change almost nothing

APPENDIX I  
BRIEF SCOPE

Brief RCOPE – Using the following scale, please rate the degree to which you agree with the following statements.

- | Not at All | Somewhat | A Great Deal  |
|------------|----------|---|
| 1          | 2        | 3   |
| _____      |          | Looked for a stronger connection with God                               |
| _____      |          | Sought God's love and care  |
| _____      |          | Sought help from God in letting go of my anger                          |
| _____      |          | Tried to put my plans into action together with God                     |
| _____      |          | Tried to see how God might be trying to strengthen me in this situation |
| _____      |          | Asked forgiveness for my sins   |
| _____      |          | Focused on religion to stop worrying about my problems                  |
| _____      |          | Wondered whether God had abandoned me                                   |
| _____      |          | Felt punished by God for my lack of devotion                            |
| _____      |          | Wondered what I did for God to punish me                                |
| _____      |          | Questioned God's love for me  |
| _____      |          | Wondered whether my church had abandoned me                             |
| _____      |          | Decided the devil made this happen                                      |
| _____      |          | Questioned the power of God   |

APPENDIX J  
DEMOGRAPHICS

## Demographics

1. What is your ethnicity?

- (a) African American/Black
- (b) Asian
- (c) Caucasian/White
- (d) Hispanic
- (e) Other

2. Gender

- (a) Male
- (b) Female

3. What is your age?

- (a) 18-25
- (b) 26-35
- (c) 36-45
- (d) 46-55
- (e) 56-65
- (f) 66 or older

4. What is your occupation?

5. What is your religious affiliation?

- (a) Eastern (Buddhist, Hindu)
- (b) Catholic
- (c) Jewish
- (d) Protestant (Baptist, Methodist)
- (e) No religion
- (f) Other/Not listed

6. How often do you attend religious services?

- (a) never
- (b) once a week
- (c) more than once a week
- (d) once a month
- (e) a few times a year
- (f) once a year

## REFERENCE LIST

- Allport, G. W. (1950). *The individual and his religion*. New York: Macmillan Company.
- Antonovsky, A. (1980). *Health, stress, and coping*. San Francisco, CA: Jossey-Bass.
- Antonovsky, A. (1987). *Unraveling the mystery of health. How people manage and stay well*. San Francisco: Jossey Bass.
- Antonovsky, A. (1993). The structure and properties of the sense of coherence scale. *Social Science and Medicine*, 36, 725-733.
- Averill, J. R. (1997). The emotions: An integrative account. In R. Hogan, J. Johnson, & S. Briggs (Eds.), *Handbook of personality psychology* (pp. 513-541). San Diego: Academic Press.
- Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Beck, C. (1986). Education for spirituality. *Interchange*, 17, 148-156.
- Chatters, L. M. (2000). Religion and health: Public health research and practice. *Annual Review of Public Health*, 21, 335-367.
- Clark, W. H. (1958). How do social scientists define religion? *Journal of Social Psychology*, 47, 143-147.
- Corveleyn, J. & Luyten, P. (2005). Psychodynamic psychologies and religion: Past, present and future. In R. F. Paloutzian & C. L. Park (Eds.), *Handbook of the psychology of religion and spirituality* (pp. 21-42). New York: Guildford Press.
- Costello, A. B., & Osborne, J. (2005). Best practices in exploratory factor analysis: four recommendations for getting the most from your analysis. *Practical Assessment Research and Evaluation*, 7, 1-9.
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment*, 49,
- Dittes, J. E. (1969). Psychology of religion. In G. Lindzey & E. Aronson (Eds.), *The handbook of social psychology* (2<sup>nd</sup> ed., Vol. 5, pp. 602-659). Reading, MA: Addison-Wesley.

- Eagly, A. H. & Chaiken, S. (1993). *The psychology of attitudes*. New York: Harcourt
- Ekman, P. (1992). Are there basic emotions? *Psychological Review*, 99, 550-553.
- Ellison, C. G. (1995). Race, religious involvement and depressive symptomology in a southeastern US community. *Social Science and Medicine*, 40, 1561-1572.
- Ellison, C. G. (1998). Introduction to Symposium: Religion, Health and Well-Being. *Journal for the Scientific Study of Religion*, 37(4), 692-694.
- Ellison, C. G., & Levin, J. S. (1998). The religion-health connection: Evidence, theory and future directions. *Health Education and Behavior*, 25, 700-720.
- Ellison, C. G., & Taylor, R. J. (1996). Turning to prayer: Social and situational antecedents of religious coping among African Americans. *Review of Religious Research*, 38, 111-131.
- Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods*, 4(3), 272-299.
- Fazio, R. H. & Olson, M. A. (2003). Implicit measures in social cognitive research: Their meaning and use. *Annual Review of Psychology*, 54, 297-327.
- Ferrano, K. F., & Koch, J. R. (1994). Religion and health among black and white adults: Examining social support and consolation. *Journal for the Scientific Study of Religion*, 33, 362-375.
- George, L. K., Larson, D. B., Koenig, H. G., & McCullough, M. E. (2000). Spirituality and health: What we know, what we need to know. *Journal of Social and Clinical Psychology*, 19, 102-116.
- George, L. K., Ellison, C. G., & Larson, D. B. (2002). Explaining the relationships between religious involvement and health. *Psychological Inquiry*, 12(3), 190-200.
- Helminiak, D. A. (1996). A scientific spirituality: The interface of psychology and theology. *The International Journal for the Psychology of Religion*, 6, 1-19.
- Hill, P. C. (2005). Measurement in the Psychology of Religion and Spirituality. In RL Paloutzian and CL Park (Eds.), *Handbook of the Psychology of Religion and Spirituality* (pp.43-61). New York: The Guilford Press.
- Hill, P. C., Butter, E. M. (1995). The role of religion in promoting physical health. *Journal of Psychology and Christianity*, 14(2), 141-155.

- Hill, P. C., Pargament, K. I., Hood, R. W., McCullough, M. E., Swyers, J. P., Larson, D. B., & Zinnbauer, B. J. (2000). Conceptualizing religion and spirituality: Points of commonality, points of departure. *Journal for the Theory of Social Behavior*, 30, 51-77.
- Hill, P. C., & Pargament, K. I. (2003). Advances in the conceptualization and measurement of religion and spirituality. Implications for physical and mental health research. *American Psychologist*, 58, 64-74.
- Hummer, R. A., Rogers, R. G., Nam, C. B., and Ellison, C. G. (1999). Religious involvement and US adult mortality. *Demography*, 36, 273-285.
- Idler, E. L., and Kasl, S. V. (1997). Religion among disabled and non-disabled persons II: Attendance at religious services as a predictor or the course of disability. *Journal of Gerontology: Social Science*, 52B, S306-S316.
- Ironson, G., Solomon, G. F., Balbin, E. G., O'Cleirigh, C., George, A., Kumar, M., Larson, D., and Woods, T. E. (2002). The Ironson-Woods Spirituality/Religiousness Index is associated with long survival, health behaviors, less distress and low cortisol in people with HIV/AIDS. *Annals of Behavioral Medicine*, 24(1), 34-48.
- Jarvis, G. K., & Northcott, H. C. (1987). Religion among disabled and non-disabled persons II: Attendance at religious services as predictor of the course of disability. *Journal of Gerontology: Social Sciences* 52B: 306-16
- Katz, I. & Stotland, E. (1959). A preliminary statement to a theory of attitude structure and change. In S. Kock (Ed.), *Psychology: A study of a science*. (pp. 423-475) New York: McGraw-Hill.
- Kiecolt-Glaser, J. K., McGuire, L., Robles, T. F., and Glaser, R. (2002). Emotions, morbidity, and mortality: New perspectives from psychoneuroimmunology. *Annual Review of Psychology*, 53, 83-108.
- Kirkpatrick, L. A., & Hood, R. W. (1990). Intrinsic-extrinsic religious orientation: The boon or bane of contemporary psychology of religion. *Journal for the Scientific Study of Religion*, 29, 442-462.
- Koenig, H. G. (1994). Religion and hope for the disabled elder. In JS Levin (Ed.), *Religion in Aging and Health: Theoretical Foundations and Methodological Frontiers* (p.18-51). Thousand Oaks, CA: Sage.

- Koenig, H. G., George, L. K., Cohen, H. J., et al. (1998). The relationship between religious activities and blood pressure in older adults. *International Journal of Psychiatry Medicine*, 28, 189-213.
- Koenig, H. G., Idler, E., Kasl, S., Hays, J. C., George, L. K., Musick, M., et al. (1999). Religion, spirituality, medicine: A rebuttal to skeptics. *International Journal of Psychiatry in Medicine*, 29, 123-131.
- Krause, N., Herzog, A. R., & Baker, E. (1992). Providing support to others and well being in later life. *Journal of Gerontology*, 47, 300-311.
- La Pierre, L. L. (1994). A model for describing spirituality. *Journal of Religion and Health*, 33, 153-161.
- Levin, J. S., & Vanderpool, H. Y. (1987). Is frequent religious attendance really conducive to better health? Toward an epidemiology of religion. *Social Science and Medicine*, 24, 589-600.
- Matthews, D. A., Larson, D. B., & Barry, C. P. (1993). *The faith factor: An annotated bibliography of clinical research on spiritual subjects*. Rockville, MD: National Institute for Healthcare Research.
- Mattlin, J. A., Wethington, E., & Kessler, R. (1990). Situational determinants of coping and coping effectiveness. *Journal of Health and Social Behavior*, 31, 103-122.
- McClelland, D. C. (1985). How motives, skills and values determine what people do. *American Psychologist*, 40, 812-825.
- McCullough, M. E., Hoyt, W. T., Larson, D. B., Koenig, H. G. (2000). Religious involvement and mortality: A meta-analytic review. *Health Psychology*, 19, 211-222.
- Miller, W. R., and Thoresen, C. E. (2000). Spirituality, religion and health: An emerging field of research. *American Psychologist*. 58(1), 24-35.
- Mischel, W. (1999). Personality coherence and dispositions in a cognitive-affective personality system (CAPS) approach. In D. Cervone & Y. Shoda (Eds.), *The coherence of personality: Social-cognitive bases of consistency, variability, and organization* (pp. 37-60). New York: Guilford.
- Musick, M. A., Herzog, A. R., & House, J. S. (1999). Volunteering and mortality among older adults: Findings from a national sample. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 54, 173-180.

- National Institute on Aging/Fetzer Institute Working Group (1997). *Measurement scales on religion, spirituality, health and aging*. Bethesda, MD: National Institute on Aging.
- O'Conner, B. P. (2000). SPSS and SAS programs for determining the number of components using parallel analysis and Velicer's MAP test. *Behavioral Research Methods, Instruments and Computers*, 32, 396-402.
- Oman, D., & Reed, D. (1998). Religion and mortality among the community dwelling elderly. *American Journal of Public Health*, 88, 1469-1475.
- Oman, D., & Thoresen, C. E. (2002). Does religion cause health? Differing interpretations and diverse meanings. *Journal of Health Psychology*, 7, 365-380.
- Oman, D., Thoresen, C. G., & McMahon, K. (1999). Volunteerism and mortality among the community dwelling elderly. *Journal of Health Psychology*, 4, 310-316.
- Oxman, T. E., Freeman, D. H., Manheimer, E. D. (1995). Lack of social participation or religious strength and comfort as risk factors for death after cardiac surgery in the elderly. *Psychosomatic Medicine*. 57, 5-15.
- Paloutzian, R. F., & Park, C. L. (2005). (Eds.), *Handbook of the psychology of religion and spirituality* New York: Guildford Press.
- Pargament, K. I., Smith, B. W., Koenig, H. G., et al. (1998). Patterns of positive and negative religious coping with major life stressors. *Journal for the Scientific Study of Religion*. 37, 710-724.
- Pargament, K. I., Koenig, H. G., & Perez, L. M. (2000). The many methods of religious coping: Development and initial validation of the RCOPE. *Journal of Clinical Psychology*, 56, 519-543.
- Patel, C., Marmont, M, Terry, D. J., Carruthers, M, Hunt, B, & Patel, M. (1985). Trial relaxation in reducing coronary risk: Four year follow-up. *British Medical Journal*, 290, 1103-1106.
- Perkins, H. W. (1985). Religious traditions, parents and peers as determinants of alcohol and drug use among college students. *Review of Religious Research*, 27, 15-31.
- Powell, L. H., Shahabi, L., and Thoresen, C. E. (2003). Religion and spirituality: Linkages to physical health. *American Psychologist*, 58(1), 36-52.

- Reilly, M. E. (2006). *Toward a new definition of spirituality*. Unpublished master's thesis, Loyola University Chicago.
- Reilly, M. E., & Heath, L. (2006, October). *Toward a new definition of spirituality*. Paper presented at the Society for the Scientific Study of Religion annual conference, Portland, Oregon
- Reilly, M. E. (2008). Development and Factor Analysis of a Questionnaire of Spirituality. Unpublished Manuscript.
- Reynolds, P., & Kaplan, G. A. (1990). Social connections and risk for cancer: Prospective evidence from the Alameda County Study. *Behavioral Medicine*, 9, 101-110.
- Robinson, J. P., Shaver, P. R., Wrightsman, L. S. (1991). Criteria for Scale Selection and Evaluation. In Robinson, J.P., Shaver, P.R., Wrightsman, L.S. (Eds). *Measures of Personality and Social Psychological Attitudes*. (pp. 1-16). San Diego: Academic.
- Rose, B. M., Holmbeck, G. N., Coakley, R. M., & Franks, E. A. (2004). Mediator and Moderator Effects in Developmental and Behavioral Pediatric Research. *Developmental and Behavioral Pediatrics*, 25, 58-67.
- Rosenberg, M. J. & Hovland, C. I. (1960). Cognitive, Affective, and Behavioral Components of Attitudes. In C. I. Hovland & M. J. Rosenberg (Eds.), *Attitude organization and Change: An analysis of consistency among attitude components*. (pp. 1-14). New Haven, CT: Yale University Press.
- Ryan, R. M., Rigby, S., & King, K. (1993). Two types of religious internalization and their relation to religious orientation and mental health. *Journal of Personality and Social Psychology*, 65, 586-596.
- Sarason, I. G., Sarason, D. R., Shearin, E. N., & Pierce, G. R. (1987). A brief measure of social support: Practical and theoretical implications. *Journal of Social and Personal Relationships*, 4, 497-510.
- Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A re-evaluation of the Life Orientation Test. *Journal of Personality and Social Psychology*, 67, 1063-107.
- Scott, A. B. (1997). *Categorizing definitions of religion and spirituality in the psychological literature: A content analytical approach*. Unpublished manuscript. Bowling Green University.

- Seeman, T. E., Dubin, L. F., Seeman, M. (2003). Religiosity/spirituality and health. A critical review of the evidence for biological pathways. *American Psychologist*, 58, 53-63.
- Sephton, S. E., Keppman, C, Schaal, M, Thoresen, C & Spiegel, D. (2001). Spiritual expression and immune status in women with metastatic breast cancer: An exploratory study. *The Breast Journal*, 7, 345-353.
- Skinner, B. F. (1938). *The behavior of organisms: An experimental analysis*. New York: Macmillan.
- Sloan, R. P., & Bagiella, E. (2002). Claims about religious involvement and health outcomes. *Annals of Behavioral Medicine*, 24, 14-21.
- Spilka, B. (1993, August). *Spirituality: Problems and directions in operationalizing a fuzzy concept*. Paper presented at the meeting of the American Psychological Association. Toronto, Ontario.
- Strawbridge, W. J., Cohen, R. D., Shema, S. J., and Kaplan, G. A. (1997). Frequent attendance at religious services and mortality over 28 years. *American Journal of Public Health*, 87(6), 957-961.
- Steffen, P. R., Hinderliter, A. L., Blumentha, J. A., Sherwood, A. (2001). Religious coping, ethnicity, and ambulatory blood pressure. *Psychosomatic Medicine*, 63, 523-530.
- Steger, M. F., & Frazier, P. (2005). Meaning in life: One link in the chain from religiousness to well-being. *Journal of Counseling Psychology*, 52(4), 574-582.
- Tabachnick, B. G., & Fidell, L. S. (2001). *Using Multivariate Statistics*. Boston: Allyn and Bacon.
- Thoresen, C. E., & Harris, A. H. S. (2002). Spirituality and health: What's the evidence and what's needed? *Annals of Behavioral Medicine*, 24, 3-13.
- Timio, M., Lippi, G., Venanzi, S., Gentili, S., Quintaliani, G., Verdura, C., et al. (1997). Blood pressure trend and cardiovascular events in nuns in a secluded order: A 30 year follow-up study. *Blood Pressure*, 6, 81-87
- Woods, T. E, Antoni, M., Ironson, G. H., & Kling, D. W. (1999). Religiosity is

associated with affective and immune status in symptomatic HIV-infected gay men. *Journal of Psychosomatic Research*, 46, 165-176.

Wyer, A. R., Masuda, M., & Holmes, T. H. (1968). Seriousness of Illness Rating Scale. *Journal of Psychosomatic Research*, 11, 363-375

Zinnbauer, B. J., Pargament, K. I., Cole B., et al. (1997). Religion and Spirituality: Unfuzzifying the fuzzy. *Journal for the Scientific Study of Religion*, 36, 549-564.

Zinnbauer, B. J., & Pargament, K. I. (2005). Religiousness and Spirituality. In RL Paloutzian and CL Park (Eds.), *Handbook of the Psychology of Religion and Spirituality* (pp.21-42). New York: The Guilford Press.

Zinnbauer, B. J., Pargament, K. I., & Scott, A. B. (1999). The emerging meanings of religiousness and spirituality: Problems and prospects. *Journal of Personality*, 67, 889-891

## VITA

Before attending Loyola University Chicago, Meghanne Reilly Sennott attended Southern Methodist University in Dallas, Texas where she earned a Bachelor of Arts in Psychology, with Highest Distinction, and a minor in Religious Studies. Meghanne graduated Magna Cum Laude in 2001. From 2002 to 2006, she attended Loyola University Chicago where she received a Master of Arts in Applied Social Psychology. It was in her master's thesis that Meghanne first identified the Quadripartite Framework. Meghanne also received her Ph.D in Applied Social Psychology from Loyola University Chicago in May 2011. Currently, Meghanne lives in Chicago, Illinois with her husband and son where she plans to continue to research spirituality and physical health while refining her scale and framework of spirituality.