12-2012

Aging and Religious Participation in Late Life

Kuan-Yuan Wang
University of Nebraska-Lincoln, hry950197@gmail.com

Follow this and additional works at: http://digitalcommons.unl.edu/cehsdiss

Part of the Geriatrics Commons, and the Social and Behavioral Sciences Commons

Wang, Kuan-Yuan, "Aging and Religious Participation in Late Life" (2012). *Public Access Theses and Dissertations from the College of Education and Human Sciences*. 160.
http://digitalcommons.unl.edu/cehsdiss/160

This Article is brought to you for free and open access by the Education and Human Sciences, College of (CEHS) at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Public Access Theses and Dissertations from the College of Education and Human Sciences by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

Aging and Religious Participation in Late Life

by

Kuan-Yuan Wang

A DISSERTATION

Presented to the Faculty of

The Graduate College at the University of Nebraska

In Partial Fulfillment of Requirements

For the Degree of Doctor of Philosophy

Major: Human Sciences

(Gerontology)

Under the Supervision of Professor Karl Kosloski

Lincoln, Nebraska

December 2012

Aging and Religious Participation in Late Life

Kuan-Yuan Wang, Ph.D.

University of Nebraska, 2012

Adviser: Karl Kosloski

Objective: The aim of the study is to evaluate the relationship between two dimensions of religiosity, religious service attendance and religious beliefs, and the process of aging, controlling for the effects of covariates known to affect religious development among older adults. Methods: Secondary analysis of longitudinal data from the Florida Retirement Study was used to assess the trajectories of religious development over time as modeled with two growth processes: religious service attendance and religious beliefs. We analyzed data from six interview waves (Waves 1 and 5 - 9) with 1000 older adults age 72 or over. Covariates included demographic factors (age, gender, marital status, income, education and religious preference), functional disability, and self-rated global health. A latent variable growth model of religious attendance and self-rated religiosity was estimated using Mplus version 6.1. Results: A baseline model (Model 1) of growth processes only (i.e., without predictor variables) indicated significant variation and mean decline in religious attendance, but no significant variation nor mean change in religious beliefs over time. This initial model also showed significant variation in both religious attendance and religious beliefs at the first wave analyzed. Based on these findings, a second model (Model 1a) was estimated that included an intercept for both latent variables, but included a slope term for religious attendance only. Additionally, to

increase parsimony, this second model also constrained the error variances of the indicators for religious attendance to be equal and the error variances of religious beliefs to be equal (Model 2). Finally, a third model (Model 3) was estimated that included the latent variables of model 2 and constrained error variances, plus a set of 17 covariates. The model fit statistics for the final model of religious attendance indicated very good fit for this latent growth curve model: χ^2 (293.5 on 173 df; p<.001); CFI =.97; TLI =.96; SRMR=.039, RMSEA = .027 (90% CI=.021-.032). Conclusion: The decline in mean religious attendance across time did not accompany a mean increase in religious beliefs as expected. There were numerous individual differences in the trajectory of decline for religious attendance, as well as in the initial levels of attendance and religious beliefs.

COPYRIGHT PAGE

DEDICATION

I dedicate this dissertation to my wonderful family and the memory of my mother.

AUTHOR'S ACKNOWLEDGEMENTS

TABLE OF CONTENTS

LIST OF TABLES

ix

LIST OF FIGURES

CHAPTER 1

Introduction

Religion and health among the aged have constituted an emerging research field. Religious participation is an imperative aspect of life for many people. Since physical health problems are prevalent in late life, research on religion, aging, and health is especially important because health problems are likely to restrict religious participation. Moreover, religion encompasses different dimensions, and older people's involvement in each dimension is likely to be different and may change with age (Chatters, Levin, & Taylor, 1992; Markides, 1983; R. J. Taylor, 1986). It has long been thought that adults become more religious as they age. As people grow older, religion might become increasingly important as they approach the end of life (Barna, 2002; Blazer & Palmore, 1976; Davie & Vincent, 1998; Moberg, 1999). Religious involvement is undertaken not only in response to illness in the pursuit of physical healing, but also for the purpose of seeking comfort and strength. Religious groups can offer both spiritual and tangible support to older adults. Meanwhile, as people proceed through late life, religion seems to be a significant resource for people coping with stresses in the face of suffering and death (E. L. Idler, McLaughlin, & Kasl, 2009; H. G. Koenig, 2003). Research among older adults indicates a positive relationship between age and subjective religiosity (R. J. Taylor, 1986), while participation in formal organizational activities declines with advancing age (Adams & Brittain, 1987; Ainlay, Singleton Jr, & Swigert, 1992; H. G. Koenig, McCullough, & Larson, 2001; Levin & Taylor, 1993).

Health impairments may potentially confound the relationship between age and religious participation. It can be poor physical health associated with aging rather than

aging itself that is related to low religious attendance. As a result, it is necessary to include a measure of physical health in exploring the relationships between aging and religious participation. We also have to include other functional indicators of aging such as older persons' ability to perform daily activities in exploring the relationships between aging and religious attendance (Adams & Brittain, 1987).

Purpose

The greater levels of subjective religiousness or religious beliefs among the very old seem to be a reflection of aging, not merely a phenomenon explained by cohort differences (Markides, 1983; Moberg, 2001). Although some previous research suggested stability in religiousness across adulthood (Seifert, 2002), the greater levels of religious beliefs among older adults seem to be an age effect rather than a cohort difference (Markides, 1983; Moberg, 2001).

Although age and cohort effects are typically confounded, even in longitudinal research, most previous research has been cross-sectional. Cross-sectional studies can hardly answer questions about intra-individual change or inter-individual differences in intra-individual change over time. Multiple wave panel studies on religious involvement would provide more compelling evidence for both an increase in religious beliefs and decline in religious attendance as persons grow older (Wink & Dillon, 2002; Wink, Ciciolla, Dillon, & Tracy, 2007).

In order to address the methodological limitations of previous research, we use growth curve modeling to examine religious involvement, measured as religious service attendance and religious beliefs across six waves of data. As a parsimonious method for analysis of repeated measures, it is used to estimate the trajectories of change as a function of time. It enables us to assess the within-individual change over time and the inter-individual differences in patterns of change and estimate how certain covariates affect the growth pattern (Singer & Willett, 2003). It also helps explain individual differences in the levels of the outcomes of interest.

Research Questions

This study addresses two research questions: First, what is the pattern of change (increase or decrease) of religious involvement among older people aged 72 or more years using two outcomes – religious service attendance, and religious beliefs? Second, does age status emerge as a unique predictor of such religious behavior? We also sought to explore the relationships between the two outcomes of religious behavior and functional disability, health status, gender, education, income, marital status, religious affiliation, and five chronic disease states among these participants.

Chapter II

REVIEW OF LITERATURE

Religious Behavior

Organizational religious behaviors include religious attendance, church membership, participation in formal groups, and holding positions and offices. Because religious attendance builds a foundation for the social support and belonging functions, it is centrally important among the dimension of organizational religiosity and can be the most robust measure of formal religious activity for older people. A measure of religious service attendance not only taps into a variety of salient underlying motivating forces governing one's attendance, but also could be a marker of multidimensional experience. It provides physical, emotional and social experiences (E. L. Idler et al., 2009) and a general sense of religious involvement. Although few religion scales have been used as outcome measures, it is imperative to consider the impact of health on religiosity (Hill & Pargament, 2003)

In addition to actual physical attendance at religious activities, it is possible to be psychologically engaged. Religion encompasses important social and psychological factors in the life of older adults. Some religious behaviors such as church attendance are correlated to some dimensions of religious beliefs. However, many aspects of religious belief are independent of self-reported religious behaviors (Heintz & Baruss, 2001). According to the three-dimensional model of religiosity proposed by Chatters, Levin and Taylor (1992), religious belief is specifically treated as a single dimension. Hence, one

spirituality dimension, measured by a single item of religious belief, represents subjective religiosity in our study.

Factors Affecting Religious Behavior

Health Status

Chronic health conditions can limit one's activity level. For example, less physical activity among older people with arthritis was noted for those attending church frequently (Kaplan, Huguet, Newsom, & McFarland, 2003). In addition, older adults often experience an increase in functional limitations. Previous longitudinal research has documented that higher functional limitations are associated with less religious service attendance (Kelley-Moore & Ferraro, 2001). Functional limitations, chronic health conditions, and self-rated global health will be included in the present study as control variables aimed to lessen capturing the effect of overall health status instead of religious commitment as we assess older adults' religious attendance. In other words, these health status variables were included in this analysis as covariates to avoid their spurious effects on religious attendance and religious beliefs when we investigate the relationship between aging and religious behavior. As covariates, it is also possible to evaluate the unique effects of these variables on our outcomes of interest.

Demographic and socioeconomic characteristics

Demographic and socioeconomic characteristics of the older population have been shown to be related to church participation. It appears that social-structural factors bear unique and individual relationships with specific domains of religious involvement. For example, different aspects of religious involvement may reflect divergent relationships with economic status. Previous studies have found a positive relationship between educational attainment and religious attendance (Chatters, Taylor, & Lincoln, 1999; R. J. Taylor, Chatters, & Jackson, 2007). This finding may reflect generally lower levels of social integration among more disadvantaged persons (Banerjee, Perry, & Tran, 2010). However, Iannaccone (1998) found that income had only a weak positive effect on religious attendance. Furthermore, income had a negative effect on subjective religiosity, which indicated higher subjective religious involvement occurring among older persons who possessed relatively fewer material resources (R. J. Taylor et al., 2007). Thus, subjective religiosity may be more likely to arise out of their particular circumstances of belonging to lower social-economic status positions.

Previous studies have shown that gender and marital status are also important factors with respect to religious participation among older adults. Gender differences in religious involvement indicated that, regardless of the religious dimensions examined, women displayed higher levels of religious participation than men (Chatters et al., 1999; E. L. Idler & Kasl, 1997). Gender differences in religious involvement may be expressed through different possible mechanisms. For example, female socialization experiences reflective of "feminine" characteristics are congruent with religious orientation. Women's traditional family role of childbearing and family well-being also encourages

greater religiosity, while men's traditionally strong commitment to paid employment restrains their religious pursuit. Some speculate that women's inequality in socioeconomic status may also direct them to seek religious coping for the stress (Krause et al., 2010; Levin, Taylor, & Chatters, 1994; R. J. Taylor, Mattis, & Chatters, 1999).

Whereas the causal relationship between gender and religious behavior is straightforward, the relationship between marital status and religious behavior is less so. Religious behavior could affect marital status as well as the reverse, especially among older adults. In any case, married older adults are more likely than unmarried ones to report high levels of organizational, non-organizational and subjective religiosity (Levin, Taylor, & Chatters, 1995; Levin & Chatters, 1998).

Other demographic factors such as denominational preferences are also important as predictive variables of religious involvement. For example, church attendance has been shown to be higher among Catholics (Smith, 1990; Stoneham, 2005) . For purposes of the present study, "Protestant" comprises any post-Reformation Christian church, "Catholic" refers to the Roman Catholic Church, "Jewish" indicates branches of Judaism, and "Other" refers to all the other mentions.

Trajectories of Change

Given the foregoing considerations, we expect a mean change across time that will be positive for religious beliefs, but negative for religious attendance. Attendance at religious services is likely to become more and more sensitive to declining health as people reach advanced ages and thus becomes increasingly a proxy for health status. Since disability could limit one's ability to participate in organized religious activities, religious attendance may become a better indicator of one's ability to be active than his or her religious commitment (H. G. Koenig, 2002; Roff et al., 2006). Thus, attendance should decline over time.

Psychological engagement is somewhat different. Religious involvement is associated with better quality of life, marital stability, and a sense of life purpose. Religion can also be used in coping with negative life events such as illness and death (Pargament et al., 1990). As older adults deteriorate both physically and mentally, they may turn to religion as positive resources to cope with the helpless and powerless of their lives. Thus, we expect level of religious belief to increase over time.

Chapter III

Methods and Procedures

Sample

This study was a secondary analysis of data from the Florida Retirement Study, a multi-wave, longitudinal study. Face-to-face interviews had been conducted from 1990 to 1999 with 1,000 adults age 72 or older at wave 1. Researchers recruited randomly participants from three retirement communities on the west coast of Florida. Nearly all of the respondents were white and obtained from a small geographic area. The sample in this longitudinal study was composed of the oldest-old residents who were initially in good functional health and free of major mental impairments. The participants received annual interviews to observe the dynamics of aging in this population.

We analyzed data from six interview waves (wave 1 and wave 5 to wave 9). Wave 1 contained the time-invariant demographic information and waves 5 to 9 contained the outcomes of interest (i.e., religious attendance and religious beliefs).

Measures

Religious Behavior

Two dimensions of religious behavior were studied. Each dimension was assessed using a single indicator measured at each of five waves. To measure frequency of their religious services attendance, respondents were asked "During the past year, how often did you attend religious services?" The eight categories were scored "never" (0), "less than twice" (1), "several times" (2), "about once a month" (3), "two or three times a month" (4), "every week" (5), "several times a week" (6), and "every day" (7). This religious attendance item makes our study comparable with most other research in the field in that it uses a single item.

Participants were also asked to rate their subjective religiosity based on the question "Could you tell me how religious you consider yourself?" Five response categories were used: (1) "not at all religious," (2) "not very religious," (3) "somewhat religious," (4) "religious," and (5) "very religious." This single item comprised our measure of religious beliefs.

Covariates

Age at wave 1 was measured in years and ranged from 72 to 98. Gender was coded as a binary variable where 1 referenced men and 2 referenced women. Education level was assessed as an interval-level variable that ranged from 5 to 23 years of schooling. Marital status included: married, widowed, divorced, separated, and never married. We collapsed this variable into four dummy variables: married, widowed, divorced/separated, and never married. Income was assessed as an ordinal variable and had 14 categories with the lowest income category less than $2,500 (coded 1), and the highest greater than $50,000 (coded 14).

We also included a variable indicating religious denomination preference primarily to control for differences in religious service attendance norms. Respondents were asked at baseline, "What is your religious preference?" Six nominal response categories were provided: Protestant, Catholic, Jewish, Other, Refused and None. Because of small numbers, we combined the Other, Refused and None categories. Religious affiliation was further collapsed into four categories (Protestant , Catholic, Jewish and Other/Refused/None) and were represented by three dummy variables with "Protestant" being the reference category.

We combined three indicators of self-rated health, self-image of health, health over the past year and health compared to others, into a single overall composite scale. Self-image of health was rated on a 5-point scale that reflects how the respondent would rate his or her present health. Respondents were asked, "In general, do you consider yourself to be a (coded as 5) very healthy, (4) healthy, (3) fairly healthy, (2) sick, or (1) very sick person?" The question for the self-comparative form of self-rated health was

similar: "In general, considering your health over the past year, would you say your health is (5) excellent, (4) good, (3) fair, (2) poor, or (1) very poor?" For an age-comparative form of self-rated health, respondents were asked, "Compared to other people your age, would you say that your health is (5) much better, (4) better, (3) about the same, (2) worse, or (1) much worse over the past year?" The internal consistency (Cronbach's alpha) estimate of this composite was .90.

Functional limitation was measured with a mean score of self-reported difficulty with five items from Self-Maintenance Activities of Daily Living (ADLs) and nine items from the Instrumental Activities of Daily Living (IADLs) (Spector, Katz, Murphy, & Fulton, 1987). The ADLs were eating without assistance, dressing and putting on shoes, washing and bathing, getting in or out of bed unassisted, and getting to or using the toilet. IADLs included getting from room to room, going out of doors, walking up and down stairs, caring yourself during illness, doing laundry, doing housework, preparing meals, shopping for groceries, and taking medicine. They were characterized as being independent in all ADLs or IADLs if they could do each of them without help. For all items, response categories ranged from (1) never having difficulty to (4) always having difficulty. The resulting composite scale for functional disability proved to be somewhat skewed and kurtotic. Therefore, we undertook a transformation of $(-1)*(1/disability^2)$ to normalize the distribution.

Data Analysis

Growth curve analysis was used to describe and explain individual change over the multiple waves of data. Specifically, growth curve methodology was used to characterize the trajectories of change in religious development over time as modeled with two growth processes: religious service attendance (A) and religious beliefs (B). A linear model was hypothesized and included five repeated and equally spaced observations (Figure 3.1). The first factor referred to the estimated intercept factor for attendance (IA). It corresponded to the mean and variance of the sample of individual intercepts representing each person's initial level or starting point with respect to the factor. The second factor referred to the estimated slope factor for linear change in attendance (SA) across the five waves was included in the growth curve analysis. More specifically, this factor represented the average change over time and its variance. The variation around the average slope represents the variation among respondents in the steepness of each individual's slope across the multiple waves. If there is no statistically significant variation in the individual slopes, then there is no point in testing whether covariates might explain the variation because there is essentially no variation to explain.

The loadings of the paths from the Intercept to the observed variables from wave 5 to wave 9 were fixed to 1 and the loading of the slope factor loaded to 0 on the first observation (wave 5). The model was specified so that the intercept served as the starting point for attendance. The time metric scaling loadings were fixed to 0, 1, 2, 3 and 4, representing a linear, one-year difference between each measure. The growth model for self-rated religiosity was specified the same way as the linear growth curve for religious

attendance. Thus, there were two parameters (A & B) associated with both the intercept and the slope in our full model (Figure 3.2).

The inclusion of predictors allowed an evaluation of which variables significantly predicted variations of intercept and slope (Figure 3.3). A set of relevant covariates included demographic factors, functional limitation assessed at wave 1, and self-rated health measured at wave 5. The growth model was specified and estimated using Mplus version 6.1 (Muthén & Muthén, 1998-2010).

Prior to conducting our growth curve analyses, we used the multiple imputation (MI) option in Mplus 6.1 to handle missing data. This procedure uses Bayesian statistics to generate multiple copies of the original data set, each copy of which contains different estimates for each respondent that has a missing value on a given variable. Based on recommended practices (Enders, 2010), we imputed 20 data sets with an N of 1,000 each, after replacing the missing values with imputed scores. In our subsequent growth curve analyses, Mplus averages parameter estimates derived from each of these 20 complete data sets, and calculates the standard errors based on the average of the standard errors over the set of analyses and the variation between analyses in the parameter estimates (Muthen & Muthen, 1998-2010).

The MI procedure provides more power and less bias of parameter estimates than more traditional missing values procedures such as listwise deletion. MI is based on the assumption that the original missing values are "missing at random" (i.e., are MAR). In other words, whether a given case has a missing value is related to scores on other variables included in the missing values imputation, and not to scores on other variables

not included in the MI procedure. However, even where missingness is non-ignorable

(i.e., not MAR), methodologists argue that the MI procedure generally will still provide

less biased parameter estimates than traditional methods of handling missing values

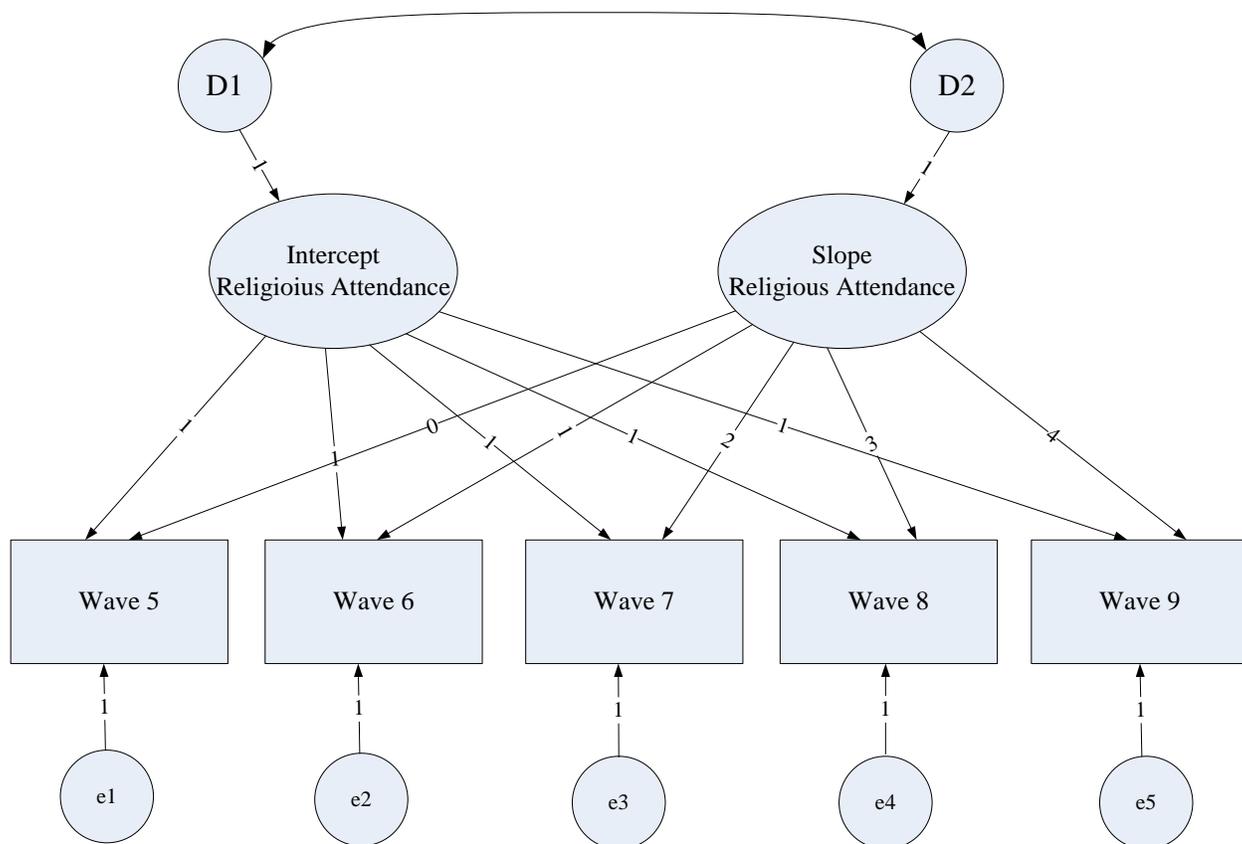(Enders, 2010; Schafer & Graham, 2002).

Figure 3.1 A simple growth curve model for the five-wave religious attendance data. D1: Disturbance of Intercept; D2: Disturbance of Slope; e: Measurement Errors.
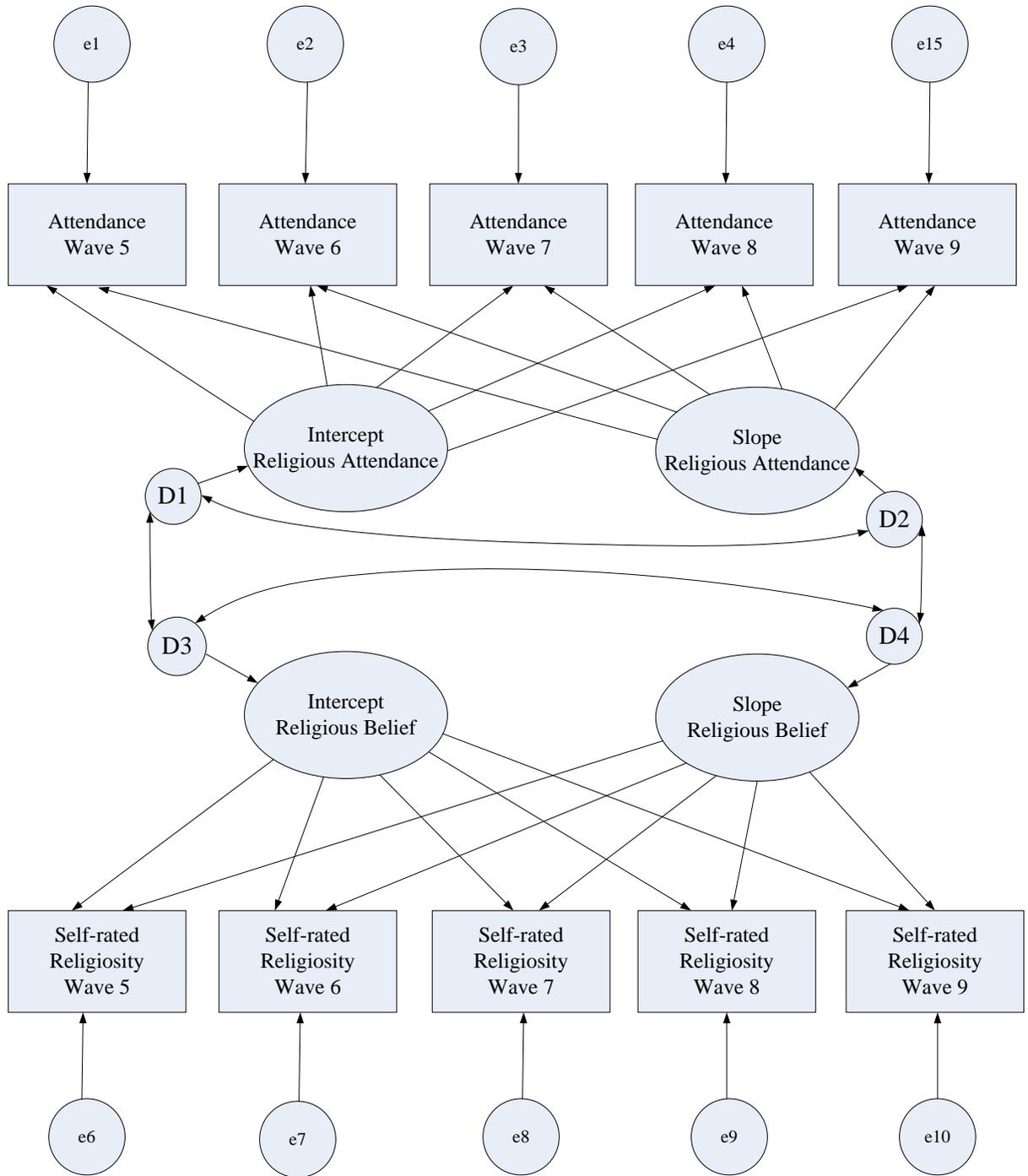
Figure 3.2 Hypothesized unconditional model of the religious development in late life

Figure 3.3 Hypothesized conditional model of the religious development in late life

Chapter IV

Results

Descriptive Statistics

Sample characteristics are provided in Table 1. The socio-demographic variables showed that slightly less than two thirds of the sample participants were female. The mean age for this sample was just about 79 years at wave 1. Fewer than half of the respondents were married with 13.6 years of education, on average. The average income of the elderly respondents was slightly more than $20,000 and 18.2% had incomes less than $12,500 a year. Almost half of the respondents (45.9%) rated their general health as "healthy," and 75% of the elderly participants reported (before transformation) no functional limitation. The measure of religious affiliation indicated that most respondents (96.3%) were religiously affiliated. Moreover, they attended religious services between one and three times a month and considered themselves to be somewhat to quite religious on average.

Table 4.1

Descriptive Statistics

Variables	N	Mean (standard deviation)	Skewness/ Kurtosis
Religious services attendance, W5[a]	583	3.14 (2.50)	-.27/-1.67
Religious services attendance, W6	522	3.25 (2.44)	-.39/-1.59
Religious services attendance, W7	521	3.18 (2.47)	-.35/-1.66
Religious services attendance, W8	443	3.20 (2.44)	-.40/-1.62
Religious services attendance, W9	418	3.09 (2.46)	-.29/-1.68
Self-rated religiosity, W5	590	3.46 (.93)	-1.00/.48
Self-rated religiosity, W6	522	3.49 (.97)	-1.08/.81
Self-rated religiosity, W7	521	3.65 (.81)	-1.24/1.84
Self-rated religiosity, W8	444	3.68 (.84)	-1.09/1.59
Self-rated religiosity, W9	418	3.56 (.90)	-1.08/1.20
Functional limitations[b]	1,000	-.90 (.21)	2.38/4.92[c]
Gender (1 = male; 2 = female)	1,000	1.66 (N/A)[d]	-.67/-1.56
Age	999	79.35 (4.82)	-.15/-.02
Income (1=<$2,500; 14>=50,000)	916	8.25 (2.90)	.23/-.39
Education (Ranges from 5 to 23)	1,000	13.58 (2.58)	.24/.48
Marrital status	1,000		
Married (1 = Yes; 0 = No)		.47 (N/A)	4.64/19.54
Widowed (1 = Yes; 0 = No)		.47 (N/A)	.14/-1.98
Divorced/Separated (1 = Yes; 0 = No)		.02 (N/A)	6.53/40.69
Never Married (1 = Yes; 0 = No)		.04 (N/A)	4.64/19.54

Table 4.1

Descriptive Statistics (continued)

Variables	N	Mean (standard deviation)	Skewness/ Kurtosis
Religious preference	1,000		
Protestant (1 = Yes; 0 = No)		.68 (N/A)	-.78/-1.39
Catholic (1 = Yes; 0 = No)		.20 (N/A)	1.47/.17
Jewish (1 = Yes; 0 = No)		.06 (N/A)	3.87/12.99
Other (1 = Yes; 0 = No)		.06 (N/A)	3.79/12.37
Major morbidity	1,000		
Cancer (1 = Yes; 0 = No)		.06 (N/A)	3.53/10.51
Emphysema (1 = Yes; 0 = No)		.09 (N/A)	2.96/6.76
Diabetes (1 = Yes; 0 = No)		.08 (N/A)	3.23/8.46
Heart Disease (1 = Yes; 0 = No)		.25 (N/A)	1.13/-.72
Arthritis (1 = Yes; 0 = No)	1,000	.54 (N/A)	-.16/-1.98

Notes:
[a]W5, W6, W7, etc. = wave 5, wave 6, wave 7, etc.
[b]All variables are measured at the wave 1 unless otherwise noted.
[c] Skew/kurtosis values: 4.79 /27.18 before transformation.
[d]Standard deviations are not reported for binary variables.

Latent Growth Curve Model

As a first step (Model 1), the data were fit to just the growth part of the model (i.e., the random slopes and intercepts). This baseline model fit the data quite well: χ^2 (41) =121.2, $p < .001$; Comparative Fit Index (CFI) = .97, Tucker Lewis index (TLI) = .97, Standardized Root Mean Square Residual (SRMR) = .060, and a Root Mean Square Error of Approximation (RMSEA) = .044 (90% confidence interval = .035-.053 (Table 4.2).

The random intercept for religious attendance had a mean value of 3.1 (SE=.11), where "3" = *once a month* and "4" = *two to three times a month*, indicating that religious attendance was not high. There was also a significant amount of individual variation around this mean (5.7; SE=.41; p<.001). Similarly, the random intercept for religious beliefs (IB) had a mean value of 3.5 (SE=.04; p<.001), where a value of "3" = *religious* and "4" = *very religious*. Thus, the level of religious belief was quite high. Moreover, there was significant variation around this mean for the study participants (.60; SE=05; p>.001).

With respect to change over time, the random slope for religious attendance had a mean value of -.17 (SE=.03; p<.001), indicating a slight downward trajectory of change over time. There was also significant variation around this mean (.13 SE=.02; p<.001), suggesting substantial individual variation in the trajectory of change on this variable. For the random slope of religious beliefs (SB), the mean change over time was .017 (SE=.011; p=.11), indicating essentially no change in religious beliefs over time. In addition, there was no significant variation around this mean, indicating that there was no

variance to explain in this variable in subsequent analyses (.003; SE=.003; p=.37).

Consequently, this variable was dropped from further consideration.

The correlation between the intercept for religious attendance and the intercept for religious beliefs was .68, indicating that those initially rated themselves high on attendance also rated themselves high on spirituality. The correlation between the intercept for religious attendance and the slope for religious attendance was -.28 (p<. 001), indicating that those initially high on attendance had a slight tendency to reduce attendance over time. In addition, the correlation between the intercept for spirituality and the slope of religious attendance was also negative (-.17; P< .05), revealing that individuals initially high in their level of religious beliefs had steeper decline over the course of the study.

Since the latent random slope was dropped from the full model, an intercept-only model was used to represent religious beliefs as an outcome in this research. This second model (Model 1a) also fit the data very well: χ^2 (46) =144.5, $p < .001$; Comparative Fit Index (CFI) = .97; Tucker Lewis index (TLI) = .97; Standardized Root Mean Square Residual (SRMR) = .065; and a Root Mean Square Error of Approximation (RMSEA) = .046 (90% confidence interval = .038-.055).

As would be expected, the relationships among the latent random effects in the latter model were similar to those found in the preceding analysis. For example, the correlation between the intercept for religious attendance and self-rated religiosity in the intercept-only model was .59 (vs. .68); between the intercept for religious attendance and

the slope for religious attendance (-.28 vs. -.28); and between the intercept for religious beliefs and the slope of religious attendance (-.09 vs. -.17).

In the interest of parsimony, we next constrained the error variances of the indicators for religious attendance and religious beliefs to be equal (Model 2). The expectation that the residual error terms for the indicators of religious attendance and religious beliefs seemed reasonable, since the same behavior is being assessed at each point in time; and it also simplified the model. Model 2 fit the data very well (see Table 4.2). Since Models 1a and Model 2 constitute nested models, a chi-square test of difference was desired to determine if the intercept-only model was statistically superior, or if the error variances could be constrained to be equal without loss of fit. Mplus, however, does not recommend a chi-square difference test using imputed data. In addition, with 1,000 cases, the test would be considered over powered. A more reasonable criterion would be a change in the Comparative Fit Index exceeding .01 (Cheung & Rensvold, 2002). That difference was only .004. As a result, the constrained error variances of the manifest indicators were retained in the final analyses.

In the final model (Model 3), 17 covariates were added to the growth model for religious attendance and the intercept-only model for self-rated religiosity (see Figure 3.3). The model fit the data quite well: χ^2 (293) =173, $p < .001$; Comparative Fit Index (CFI) = .97; Tucker Lewis index (TLI) = .96; Standardized Root Mean Square Residual (SRMR) = .039; and a Root Mean Square Error of Approximation (RMSEA) = .026 (90% confidence interval = .021-.032).

Table 4.2

Results of latent growth curve models of religious development in late life.

	Model 1: Unconditional Model	Model 2: Model 1a plus Error variance constraints	Model 3: Conditional Model With Covariates
Means			
IB	3.50*	3.52*	1.81*[b]
SB	0.02		
IA	3.06*	3.06*	-1.57[b]
SA	-0.17*	-.17*	1.69*[b]
Variances			
IB	.60/.05*[a]	.59/.04*	.45/.03*
SB	.00/.00		
IA	5.70/.41*	5.70/.41*	4.69/.33*
SA	.13/.02*	.13/.02*	.11/.02*
Model fit statistics			
Model Chi-Square	121.2*	158.1*	293.5*
Degrees of freedom	41	50	173
CFI	.972	.963	.965
TLI	.970	.966	.956
RMSEA	.044	.047	.027
90% C.I.	.035-.053	.038-.055	.021-.032

IB: Intercept of religious beliefs; SB: Slope of religious beliefs; IA: Intercept of religious attendance; SA: slope of religious attendance; CFI: comparative fit index; TLI: Tucker Lewis index; RMSEA: root mean square error of approximation
*$p<.05$.
[a] Standard Error
[b] Intercept

Covariates

The effects of the covariates on the three latent variables (i.e., the intercepts for religious beliefs and attendance, and the slope of attendance) are shown in Table 4.3. The tabled values are standardized regression coefficients for ordinal and binary predictor variables. With respect to the intercept for religious beliefs, six covariates exerted statistically significant effects. Self-rated overall health was positively related to religious beliefs indicating that those who rated themselves as healthier also rated themselves as having a higher level of religious beliefs. Age held a similar relationship in that older respondents rated themselves as having a higher level of religious beliefs. Never married individuals rated themselves as having a lower level of religious beliefs than married persons. In contrast, Jewish participants and members of "Other" faiths tended to endorse lower levels of religious belief than Protestants at the outset of the study. In contrast, Catholics endorsed higher levels than Protestants.

In the case of religious attendance, self-rated health was again important with those who rated their overall physical health as better reporting higher attendance at the outset. Functional disability was also important with lower disability resulting in higher attendance. Gender mattered as well with women more likely to attend religious services. Catholics reported higher attendance than Protestants; whereas being a member of an "Other" religious faith was associated with lower religious attendance relative to Protestants. Of the chronic health conditions, having diabetes resulted in lower attendance.

Interestingly, with respect to the change in attendance over time (i.e., slope), only income, "Other" religious faith, and not having emphysema mattered. Specifically, those with higher incomes reported increasing decline in attendance over time, as did those with emphysema.

Table 4.3

Results of covariate regressions of religious development in late life[a]

	Level of attendance on	Slope of attendance on	Level of religious belief on
Functional limitations	-.13*	.08	.03
Self-rated health	.15*	-.03	.10*
Gender	.13*	-.07	.06
Age	.05	-.02	.31*
Income	-.02	-.25*	.04
Education	.03	-.03	-.08
Widowed[b]	.03	-.05	-.08
Divorced/Separated[b]	.01	.07	.07
Never Married[b]	-.06	-.02	-.08*
Catholic[c]	.21*	.00	.13*
Jewish[c]	-.04	-.09	-.18*
Other[c]	-.12*	.14*	-.18*
Cancer	.05	.00	.07
Emphysema	-.06	-.16*	.01
Diabetes	-.09*	.16	.01
Heart Disease	.01	.05	.07
Arthritis	.01	-.05	.02

[a]These standardized coefficients represented the amount of standardized change in an outcome variable per standard deviation unit of a predictor variable.
[b]Compared to reference category of Married
[c]Compared to reference category of Protestant
*$p<.05$;

Chapter V

Discussion

The findings of this longitudinal study revealed that the frequency of attendance at religious services declined in this sample of 1,000 older adults aged 72 to 98. This pattern of findings is similar to the findings in Ainlay and Smith's (1984) analysis of aging and religious participation. Specifically, Ainlay and Smith found that women and men follow similar trajectories for religious attendance in later life despite the finding of greater devoutness of women. The same was observed in this study in that gender was unrelated to the trajectory of decline in attendance and women reported higher attendance; although there was no gender difference in level of religious beliefs.

In contrast, there was no variation in the trajectory for religious beliefs. The slope of the trajectory was essentially zero with no significant variation among individuals. One recent study indicated that religious development peaks in the 60s among people who are moderately religious in early life (McCullough, Enders, Brion, & Jain, 2005). In addition, Wink and Dillon (2001) found that the importance of religion increased as people entered their 70s. Elders tended to preserve their rank ordering on subjective religiosity over time after the mid-70s, which is consistent with our finding with respect to religious beliefs. One avenue for future research is to investigate the causes for the high stability in religious beliefs. One possibility is that it functions much like a personality trait. When given as self-descriptors, traits have shown high stability among older adults (Costa Jr. & McCrae, 1994)

Krause (1993) pointed out that different dimensions of religion were characteristically highly correlated. The present findings are consistent with this observation as well. At the outset of the study, religious attendance and religious beliefs

were found to be highly correlated (r=.68; Model 1). It seems likely that the relationship between these two dimensions of religiosity might be mutually reinforcing. That is, attendance at religious events is self-affirming evidence of a higher level of religious beliefs, and being engaged spiritually is likely to result in higher attendance. One direction for future research is to unravel the causal connection between these two variables.

Similarly, the correlation between the intercept of religious attendance and the slope for attendance was also relatively large, but negative (-.28; Model 1). In other words, those individuals who were highest in religious attendance at the start of the study showed the steepest decline in attendance over the course of the study. A plausible substantive explanation for this relationship is not obvious. One possible methodological explanation is that the relationship is indicative of a regression-to-the-mean artifact caused by measurement error in the religious attendance variable. That is, those individuals scoring relatively high or low on the initial measurement simply regressed back toward their true score mean over time. Additional research, that uses more elaborate measurement models of religious attendance with multiple indicators and that adjusts for measurement error will be necessary to evaluate this phenomenon.

The significant variation in the initial levels of religious attendance and self-rated religiosity, and the variation around the downward slope for attendance, suggested that covariates assessing demographic and health characteristics of participants might explain some of this variation. Such was indeed the case.

It has long been thought that religious attendance may simply represent older adults' physical health to a certain extent (Levin & Markides, 1988). Consistent with this

line of thinking, functional limitations showed a significant negative impact on religious attendance, supported by previous research (E. L. Idler & Kasl, 1997). Interestingly, functional limitation had no effect on religious beliefs. Thus, functional limitations appear to operate by physically impeding attendance, rather than through psychological processes such as discouragement or self-pity.

Self-rated physical health, in contrast, was related to both the intercept for religious attendance and the intercept for religious beliefs. Previous researchers have demonstrated a positive relationship between religiosity and self-rated health (Krause, Ingersoll-Dayton, Liang, & Sugisawa, 1999; Son & Wilson, 2011). It is certainly the case that physical health has a causal effect on attendance, but its relationship to religious beliefs is less straightforward. One possibility is that good health makes one more optimistic, or enhances other attitudes about oneself, whereas poor health does just the opposite. It is also the case that, since better health promotes attendance, greater attendance promotes higher levels of religious belief. From this perspective attendance and religious beliefs are causally related, which is also consistent with their large correlation (i.e. >.6).

Of the chronic disease conditions, only diabetes and emphysema exerted a unique effect on any of the outcomes. Having diabetes was negatively related to attendance in an intuitively straightforward manner with diabetes being an impediment to attendance. The effect, however, was extremely weak with a standardized path coefficient of -.09. The patients with emphysema had severely impaired pulmonary function. In a similar fashion, those with emphysema experienced steeper decline than those without it in attendance over time.

Interestingly, gender affected attendance, but not religious beliefs, with women reporting higher attendance. In contrast, increasing age was related to higher levels of religious belief, but not to attendance (once health was controlled). The finding for gender is consistent with past research, as noted earlier, and the finding for age is consistent with our expectations. In addition, though, these differential relationships underscore the need for treating the multiple dimensions of religiosity separately. Simply put, the different dimensions have different predictors.

 With respect to religious affiliation, Catholics, at the onset of the study, rated themselves as having higher levels of religious belief and reported higher attendance than did Protestants. One of the precepts of Catholicism, of course, is that members attend services on Sundays and prescribed holydays. Such is not the case with most Protestant denominations. So attendance is likely higher for Catholics, and this finding is consistent with previous research (Iannaccone, 1998). It was also noted previously that attendance and religious beliefs may be causally related. Such may be the case here.

Individuals identifying with the Jewish faith reported lower levels of religious belief than Protestants initially, but did not differ on attendance. Those in the "Other" category of religious affiliation reported lower levels of attendance than Protestants. Non-affiliates may regard themselves as outside organized religion, but that does not prohibit them from attending services. Reasons for this difference will depend on future studies with larger samples of those in the "Other" category.

Marital status was not a major explanatory variable for either attendance or religious beliefs. Never married individuals reported having lower levels of religious

belief at the outset of the study than married persons. The effect, however, was extremely weak, with a standardized path coefficient of -.08.

Finally, only three covariates, income, "Other" category of religious affiliation and emphysema, explained any of the variation around the decline in attendance. Specifically, those individuals with higher incomes showed steeper decline. One possibility is that those with higher incomes have greater demands on their time that interfere with attendance such as having to work. Similarly, those with emphysema had a greater decline in attendance. Obviously, emphysema is an impediment to mobility, especially in situations where oxygen is required. "Other" category of religious affiliation is a diverse social category and may not endorse a particular view about the institution of religion. Religious non-affiliates are considered less connected to a religious group and therefore may not be likely to attend religious services over time as well as use religious coping strategies. Further examination is warranted, and Other, Refused and None categories should not be viewed as a cohesive group as they each may reflect distinct concepts.

Limitations of the Study

Several limitations of this study should be acknowledged. First, only limited measures of religious involvement were available in our longitudinal study. Although regularity of attendance at religious services and religious beliefs are important indicators of religious involvement among older adults, there are other important indicators of religiosity as well. Examples would include private religious practices such as prayer. In addition, these important outcomes, attendance and religious beliefs, were assessed with single measures whose reliabilities are unknown. It should be noted, however, that these data were taken from a project that was not designed for research on religion.

Second, our measurement of chronic diseases, functional limitations, and self-rated global health may have missed other important indicators of health status. We did not include other potential predictor variables such as vision and hearing, which are likely to be associated with the decline in religious attendance. Furthermore, by not incorporating our current measures of health status as time-varying covariates (i.e., assessing these health measures at each of the five waves we included in our analyses), we were unable to assess the extent to which within-persons variations in these predictors was associated with within-person variations in religious involvement.

Third, transportation availability may also have contributed to the decline in religious attendance. Any future studies should certainly include measures of transportation availability. As a broader point, model specification is always an issue. Regression models assume perfect specification otherwise the parameter estimates may be biased. Model specification in this study was influenced not only by theory, but also by data availability.

Fourth, the sample of older adults in this study is primarily White, predominantly Protestant, and does not reflect the diversity of the elderly population. Although the sample was randomly selected from a Florida retirement community, the findings might not generalize to other elderly persons living in different retirement settings and in different regions of the country.

Implication

The frequency of religious service attendance begins to decline among the old-old, owing to the inevitable decline of physical functioning. Supporting an older adult's religious participation recognizes him as a whole person. Church leaders need to develop outreach services for home-bound elders to meet their psychological needs. In this way, we can promote older adults' wellbeing by increasing their resources of social, physical and psychological support in late life.

Conclusion

The results confirmed that religiosity is a multidimensional notion. Two dimensions of religiosity were studied: attendance at religious services and religious beliefs. Not surprisingly, the different dimensions of religiosity had different covariates, demonstrating their differing dimensionality.

While there was a slight average downward decline in attendance over time, the trajectory of change in religious beliefs was essentially flat (i.e., zero slope). There was significant variation among individuals in the average trajectory of decline for attendance, and this variation was potentially explainable by the set of 17 covariates available in this study. Of all the covariates, income had a significant unique effect on the change in attendance. Specifically, those with higher incomes showed steeper decline. In contrast, there was no discernible change in spirituality over the five annual waves of measurement.

With respect to individual differences at the start of the study, the results were somewhat different. Six covariates were related to individual differences in attendance at the onset of the study: functional disability, self-rated global health, gender, being Catholic, being a member of "Other" religious denominations relative to Protestants, and having diabetes. Six covariates predicted religious beliefs at the start of the study: self-rated global health, age, never being married, and being Catholic, Jewish, or a member of an "Other" denomination relative to being Protestant.

References

Adams, R. G., & Brittain, J. L. (1987). Functional status and church participation of the elderly: Theoretical and practical implications. *Journal of Religion and Aging, 3*(3/4), 35-48.

Ainlay, S. C., Singleton Jr, R., & Swigert, V. L. (1992). Aging and religious participation: Reconsidering the effects of health. *Journal for the Scientific Study of Religion,* 175-188.

Banerjee, D., Perry, M., & Tran, D. (2010). Self-reported health, functional status and chronic disease in community dwelling older adults: Untangling the role of demographics. *Journal of Community Health, 35*(2), 135-141.

Barna, G. (Ed.). (2002). *The state of the church, 2002.* . Ventura, CA: Issachhar Resources.

Blazer, D., & Palmore, E. (1976). Religion and aging in a longitudinal panel. *The Gerontologist, 16*(1 Part 1), 82.

Chatters, L. M., Levin, J. S., & Taylor, R. J. (1992). Antecedents and dimensions of religious involvement among older black adults. *Journal of Gerontology, 47*(6), S269.

Chatters, L. M., Taylor, R. J., & Lincoln, K. D. (1999). African american religious participation: A multi-sample comparison. *Journal for the Scientific Study of Religion,* 132-145.

Costa Jr., P. T., & McCrae, R. R. (1994). Set like plaster? evidence for the stability of adult personality. In T. F. Heatherton J. L. Weinberger (Ed.), (pp. 21-40). Washington, DC: American Psychological Association.

Davie, G., & Vincent, J. (1998). Religion and old age. *Ageing and Society, 18*(01), 101-110.

Enders, C. K. (2010). *Applied missing data analysis*. New York, NY: The Guilford Press.

Heintz, L. M., & Baruss, I. (2001). Spirituality in late adulthood. *Psychological Reports, 88*(3), 651-654.

Hill, P. C., & Pargament, K. I. (2003). Advances in the conceptualization and measurement of religion and spirituality. implications for physical and mental health research. *The American Psychologist, 58*(1), 64-74.

Iannaccone, L. R. (1998). Introduction to the economics of religion. *Journal of Economic Literature, 36*(3), 1465-1495.

Idler, E. L., & Kasl, S. V. (1997). Religion among disabled and nondisabled persons I: Cross-sectional patterns in health practices, social activities, and well-being *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 52*(6), S294.

Idler, E. L., McLaughlin, J., & Kasl, S. (2009). Religion and the quality of life in the last year of life. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 64*(4), 528.

Idler, E. L., Boulifard, D. A., Labouvie, E., Chen, Y. Y., Krause, T. J., & Contrada, R. J. (2009). Looking inside the black box of "Attendance at services": New measures for exploring an old dimension in religion and health research. *International Journal for the Psychology of Religion, 19*(1), 1-20.

Kaplan, M. S., Huguet, N., Newsom, J. T., & McFarland, B. H. (2003). Characteristics of physically inactive older adults with arthritis: Results of a population-based study. *Preventive Medicine, 37*(1), 61-67.

Kelley-Moore, J. A., & Ferraro, K. F. (2001). Functional limitations and religious service attendance in later life. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 56*(6), S365.

Koenig, H. G., McCullough, M. E., & Larson, D. B. (Eds.). (2001). *Handbook of religion and health.* New York, NY: Oxford University Press.

Koenig, H. G. (2002). Religion, congestive heart failure, and chronic pulmonary disease. *Journal of Religion and Health, 41*(3), 263-278.

Koenig, H. G. (2003). Religion, spirituality and health: An american physician's response. *The Medical Journal of Australia, 178*(2), 51-52.

Krause, N., Ingersoll-Dayton, B., Liang, J., & Sugisawa, H. (1999). Religion, social support, and health among the japanese elderly. *Journal of Health and Social Behavior,* 405-421.

Krause, N., Liang, J., Bennett, J., Kobayashi, E., Akiyama, H., & Fukaya, T. (2010). A descriptive analysis of religious involvement among older adults in japan. *Ageing and Society, 30*(4), 671.

Levin, J. S., & Chatters, L. M. (1998). Religion, health, and psychological well-being in older adults. *Journal of Aging and Health, 10*(4), 504-531.

Levin, J. S., & Markides, K. S. (1988). Religious attendance and psychological well-being in middle-aged and older mexican americans. *Sociology of Religion, 49*(1), 66-72.

Levin, J. S., & Taylor, R. J. (1993). Gender and age differences in religiosity among black americans. *The Gerontologist, 33*(1), 16-23.

Levin, J. S., Taylor, R. J., & Chatters, L. M. (1994). Race and gender differences in religiosity among older adults: Findings from four national surveys. *Journal of Gerontology, 49*(3), S137-S145.

Levin, J. S., Taylor, R. J., & Chatters, L. M. (1995). A multidimensional measure of religious involvement for african americans. *The Sociological Quarterly, 36*(1), 157-173.

Markides, K. S. (1983). Aging, religiosity, and adjustment: A longitudinal analysis. *Journal of Gerontology, 38*(5), 621-625.

McCullough, M. E., Enders, C. K., Brion, S. L., & Jain, A. R. (2005). The varieties of religious development in adulthood: A longitudinal investigation of religion and rational choice. *Journal of Personality and Social Psychology, 89*(1), 78.

Moberg, D. O. (1999). Woman of god: An assessment of the spirituality of women in the lutheran church-missouri synod.

Moberg, D. O. (2012). *Aging and spirituality: Spiritual dimensions of aging theory, research, practice, and policy*. New York, NY: Routledge.

Pargament, K. I., Ensing, D. S., Falgout, K., Olsen, H., Reilly, B., Haitsma, K., & Warren, R. (1990). God help me:(I): Religious coping efforts as predictors of the outcomes to significant negative life events. *American Journal of Community Psychology, 18*(6), 793-824.

Roff, L. L., Klemmack, D. L., Simon, C., Cho, G. W., Parker, M. W., Koenig, H. G., . . . Allman, R. M. (2006). Functional limitations and religious service attendance among african american and white older adults. *Health and Social Work, 31*(4), 246-255.

Schafer, J. L., & Graham, J. W. (2002). Missing data: Our view of the state of the art. *Psychological Methods, 7*(2), 147.

Seifert, L. S. (2002). Toward a psychology of religion, spirituality, meaning-search, and aging: Past research and a practical application. *Journal of Adult Development, 9*(1), 61-70.

Singer, J. D., & Willett, J. B. (2003). *Applied longitudinal data analysis: Modeling change and event occurrence*. New York, NY: Oxford University Press.

Smith, T. W. (1990). Classifying protestant denominations. *Review of Religious Research, 31*(3), 225-245.

Son, J., & Wilson, J. (2011). Religiosity, psychological resources, and physical health. *Journal for the Scientific Study of Religion, 50*(3), 588-603.

Spector, W. D., Katz, S., Murphy, J. B., & Fulton, J. P. (1987). The hierarchical relationship between activities of daily living and instrumental activities of daily living. *Journal of Chronic Diseases, 40*(6), 481-489.

Stoneham, L. M. (2005). *Advances in sociology research* Nova Science Pub Inc.

Taylor, R. J. (1986). Religious participation among elderly blacks. *The Gerontologist, 26*(6), 630.

Taylor, R. J., Mattis, J., & Chatters, L. M. (1999). Subjective religiosity among african americans: A synthesis of findings from five national samples. *Journal of Black Psychology, 25*(4), 524-543.

Taylor, R. J., Chatters, L. M., & Jackson, J. S. (2007). Religious and spiritual involvement among older african americans, caribbean blacks, and non-hispanic whites: Findings from the national survey of american life. *Journals of Gerontology Series B: Psychological Sciences & Social Sciences, 62B*(4), S238-50.

Wink, P., Ciciolla, L., Dillon, M., & Tracy, A. (2007). Religiousness, spiritual seeking, and personality: Findings from a longitudinal study. *Journal of Personality, 75*(5), 1051-1070.

Wink, P., & Dillon, M. (2002). Spiritual development across the adult life course: Findings from a longitudinal study. *Journal of Adult Development, 9*(1), 79-94.