

# Latent Class Analysis of Spiritual Well-Being: Age and Religious Attitudes and Experiences as Predictors

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## ABSTRACT

This study uses latent classes of spiritual well-being using Latent Class Analysis (LCA) and investigates the predictive roles of age and religious attitudes and experiences. A sample of 5,705 adult participants aged 15-70, 3282 (57.5%) females, and 2423 (42.5%) males, respectively, was analyzed to identify distinct latent classes of spiritual well-being based on its eight indicators. The LCA model established the best number of latent classes using criteria such as the Bayesian Information Criterion (BIC) and Akaike Information Criterion (AIC), arriving at two separate classes. The elbow plot can also graphically determine an optimal number of diverse groups. After the LCA, logistic regression was employed to assess how age and religious attitudes and experiences predicted membership in these latent classes. The usual parameters of the logistic regression included odds ratios (OR), confidence intervals (CI), and significance levels, which is the p-value. The analysis has shown that older age was significantly related to a higher likelihood of being with the group of respondents who are in the "Spiritually Grounded Optimist" class (OR = 1.016, 95% CI: 1.012-1.020,  $p < 0.01$ ), while moderately positive religious attitudes are in the membership of the "Spiritually Reflective Seeker" class (OR = 3.029, 95% CI: 2.709-3.386,  $p < 0.01$ ). The above results feature how age and religious attitudes and experiences affect spiritual well-being. This research stresses the importance of the assessment of individual spiritual differences and making interventions more effective that address the varied spiritual needs of persons.

**Keywords:** Latent Class Analysis, Spiritual Well-Being, Logistic Regression, Odds Ratios, Elbow Plot.

## INTRODUCTION

Spiritual well-being is one of the principal attributes of quality of life as well as human health that cover an individual's sense of purpose and connection to something that is greater than themselves. Recognizing some patterns and factors of spiritual well-being is critical for improving effective interventions and support systems meeting different spiritual needs (Snapp & Hare, 2021).

Some approaches regularly look at spiritual well-being as a single and uniform concept. Nonetheless, some recent research revealed that it may consist of diverse latent classes, each reflecting a sole spiritual engagement and satisfaction of profile. (Choi et al., 2020).

Latent Class Analysis (LCA) poses a powerful approach to identifying these obscure subgroups within a population based on observed indicators. By applying LCA to measures of

spiritual well-being and experiences, this study would like to uncover some unique and distinct latent classes that obtain the diversity of spiritual experiences among individuals. Identifying these classes allows for a better understanding of spiritual well-being and provides some foundation for interventions designed for specific profiles (Aflaki et al., 2022; Weller et al., 2020). The moment latent classes are being identified, it will become vital to explore which indicators of dimensions may predict its membership in these classes. Previous studies have emphasized the task of age and experiential factors, such as religious attitudes and experiences, in affecting spiritual results. (Cseh et al., 2024)

Age is oftentimes related to different phases of spiritual development and life alterations, while religious attitudes and experiences influence how individuals connect with their spirituality. Nonetheless, research that simultaneously reflects both age and religious attitudes and experiences as independent variables of spiritual well-being is limited (Moberg, 2005).

It is with much certainty that this paper will address this gap by using the statistical treatment Logistic Regression Analysis on how age and religious attitudes and experiences predict membership in the latent classes of spiritual well-being identified via LCA. Hence, with this in mind, relationships will be able to cast a deeper knowledge of how age and religious attitudes and experiences influence spiritual well-being.

## LITERATURE REVIEW

A review of the literature is seemingly a growing bulk of research investigating latent classes of spiritual well-being and with age and religious attitudes and experiences as independent variables, respectively. A wide discovery of research has examined different aspects and dimensions of this topic, including its theoretical foundations, practical applications, and implications through different perspectives.

This review seeks to integrate present experience on the latent classes of spiritual well-being, identifying gaps in existing research and emphasizing areas in need of further investigation. By critically looking at the key studies, it aims to provide a comprehensive understanding of the various indicators and dimensions of spiritual well-being, with a specific focus on how age and religious attitudes and experiences take their roles as predictors. Also, this review positions the present study within the broader academic communication, giving insights into the complexities of spiritual well-being across different populations.

Latent class analysis among people living with HIV revealed three distinct classes of religiousness/spirituality, each linked with different stages of health-related quality of life. The identified classes are traditionally religious (35%), privately religious (47.1%), and spiritual but not religious (17.9%). Considerable associations were found with MOS-HIV mental health ( $p < .001$ ) and MOS-HIV attribute of life ( $p = .014$ ) (Grill et al., 2020).

A statistical tool to link age and religious attitudes and experiences on the latent classes of spiritual well-being is the logistic regression analysis. Logistic regression is a statistical approach used for modeling the relationship between a binary dependent variable and one or more independent variables. It is useful in a situation where the outcome is dichotomous, such as "success" or "failure," "yes" or "no," and the like, allowing researchers to estimate the probability of a specific outcome occurring (Hosmer, Lemeshow, & Sturdivant, 2013).

Not like linear regression, logistic regression is using the logistic function to ensure that predicted values remain within the range of 0 and 1, making it appropriate for probabilities

(Menard, 2002). This technique is widely employed in various fields, including medicine, social sciences, and economics, due to its flexibility in handling both continuous and categorical predictor variables (Peng, Lee, & Ingersoll, 2002).

In classifying respondents into categories, latent class analysis (LCA) is being used. LCA is a statistical technique used to identify hidden subgroups within a population based on a selected set of values. As LCA was found to gain recognition, the objective is to keep psychological researchers and other research areas of interest with the theoretical and statistical underpinning that would necessitate applying LCA to model ones that work well (Nylund-Gibson & Choi, 2018).

Unterrainer, Ladenhauf, Wallner-Liebmann, and Fink, in their study, used cluster analysis to identify four types of religious/spiritual well-being and their effects on personality and subjective well-being: religious/spiritual high, religiously concerned with, existentially oriented, and religious/spiritual low (Unterrainer et al., 2011).

## **METHODS**

In establishing latent classes for spiritual well-being, the study Latent Class Analysis (LCA) was employed. LCA is a statistical tool used to uncover unseen subgroups within a population based on patterns of replies and reactions to eight indicators of spiritual well-being. The data was collected from 5,705 Seventh-day Adventist (SDA) respondents with an age range of 15 to 70 years, across 13 different countries under the territory of the Southern Asia-Pacific Division. The sample consisted of 3,282 females (57.5%) and 2,423 males (42.5%). A random sampling procedure was done, where five churches were randomly chosen from each conference or mission. The survey was conducted in 2017. The assessment required choosing relevant measures of spiritual well-being and applying LCA to classify individuals into distinct latent classes.

This process helped uncover unknown subgroups within the population based on their answers on the spiritual well-being questionnaire.

When identification of latent classes was done, the logistic regression analysis was then used to conduct and examine the impact of two independent variables, namely, age and religious attitude and experiences, on the latent class membership. Logistic regression was applicable for the analysis of the effects of continuous or categorical predictors on categorical outcomes. The regression models estimated the probabilities of membership in each latent class based on variations in age and religious attitudes, providing perceptions of how these factors contribute to differences in spiritual well-being; hence, relationships were established. This approach allows for an understanding of how age and religious attitudes and experiences affect the latent classes of spiritual well-being.

## **RESULTS AND DISCUSSION**

### **Spiritual Well-Being**

The evaluation and assessment utilized several key indicators to see the extent of spiritual well-being among the respondents. These indicators are practical statements such as: "1. I have grown spiritually," "2. Because of the spiritual changes I've been through, I've changed my priorities," "3. I more often have a sense of gratitude," "4. I spend more time thinking about spiritual questions," "5. In some ways, I think I am spiritually lost," "6. My faith

has been shaken, and I am not sure what I believe," "7. I feel I've lost some important spiritual meaning that I had before," and "8. I try to avoid anger and bitterness in my heart." These items/indicators were used to detect and underlying patterns of spiritual well-being via Latent Class Analysis (LCA).

### Number of Latent Classes

To look into the optimum number of latent classes for spiritual well-being, an elbow plot analysis was used and performed. Elbow plots are just a graphical representation of the known parameters, such as the Bayesian Information Criteria (BIC) and Akaike Information Criteria (AIC), used to determine the optimal number of classes. Table 1 presents the values for AIC, BIC, adjusted BIC (ABIC), consistent AIC (CAIC), and other fit indices that were used to construct the Elbow plot and identify the appropriate number of latent classes.

**Table 1** shows the model comparison to determine the number of classes

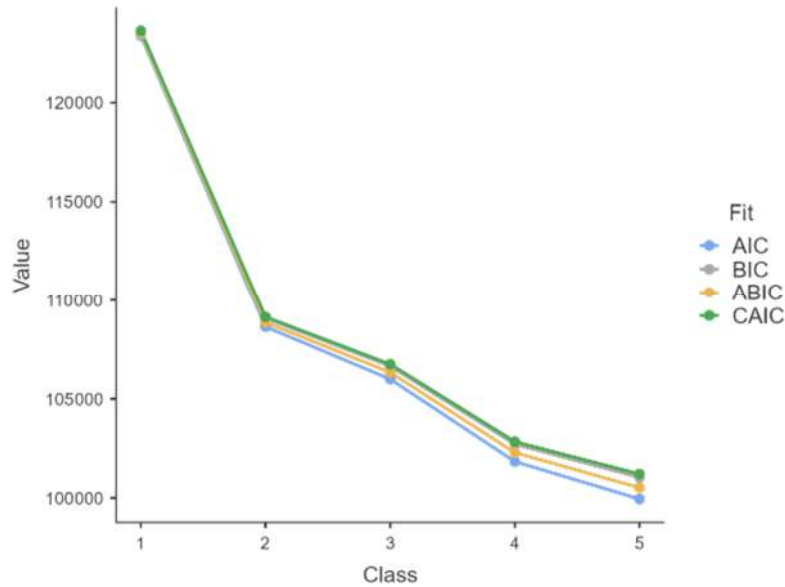
**Table 1**

Class	AIC	BIC	ABIC	CAIC	Log-likelihood	$\chi^2$	G <sup>2</sup>
1	123375	123588	123486	123620	-61656	1.39e+9	46528
2	108637	109070	108863	109135	-54254	8.36e+7	31724
3	105995	106646	106335	106744	-52899	7.09e+7	29015
4	101840	102711	102294	102842	-50789	5.07e+6	24794
5	99954	101044	100523	101208	-49813	2.89e+7	22843

The elbow plot (see Figure 1) indicated a clear "elbow" point at the two-class solution, suggesting that this model best balances model fit and parsimony. Based on these findings, a two-class model was selected for further analysis. This decision was further supported by lower values in the BIC and AIC for the two-class solution compared to models with additional classes, which would have introduced more complexity without significantly improving fit. Investigating the above table, the two-class model was chosen.

**Figure 1**

*Elbow plot showing model fit indices for different numbers of latent classes.*



### Latent Class Analysis (LCA) Results

The Latent Class Analysis (LCA) identified two distinct classes of spiritual well-being among the respondents. Class 1, labeled as **Spiritually Reflective Seeker**, comprised 50.1% of the sample. A **Spiritually Reflective Seeker** is an individual who demonstrates moderate engagement in spiritual growth characterized by moderate spiritual growth, curiosity and openness, ambivalence and uncertainty, and emotional management. This subgroup indicates a person who is in an active yet tentative phase of spiritual exploration and self-discovery.

Class 2, labeled as **Spiritually Grounded Optimist**, comprised of 49.9% of the sample. **Spiritually grounded Optimist** are those who have experienced significant spiritual growth and transformation, resulting in a deep sense of gratitude and changed priorities. They are actively engaged in spiritual reflection, with minimal feelings of doubt or spiritual crisis. Their general outlook is optimistic and confident in their spiritual journey, despite occasional uncertainties or emotional challenges. The model fit statistics for the two-class solution are presented in Table 1, demonstrating a good fit for the data.

**Table 2** shows model fit statistics (BIC, AIC, etc.) and a description of the identified latent classes of spiritual well-being.

**Table 2**

Class	Log-likelihood	Residual df	AIC	BIC	ABIC	CAIC	Entropy	G <sup>2</sup>	G <sup>2</sup> p	χ <sup>2</sup>	χ <sup>2</sup> / df
2	-54254	3905	1086	1090	1088	1091	0.87	317	1.00	8.36e +7	<.001

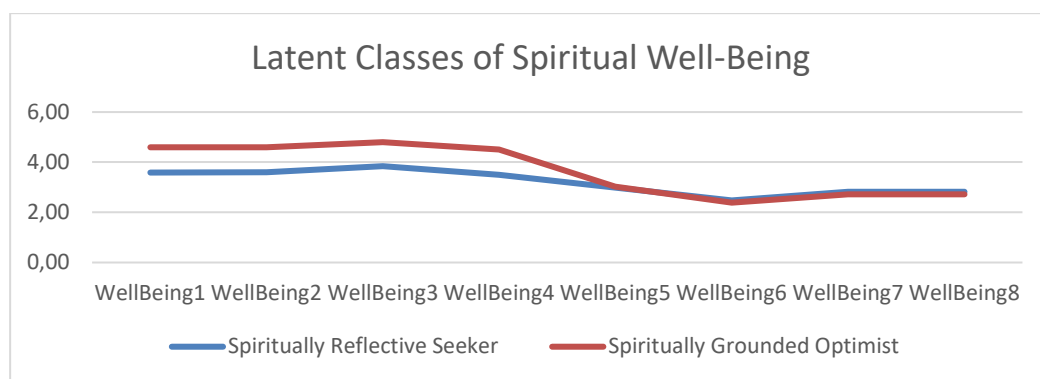
Note. G<sup>2</sup>=Likelihood ratio statistic; χ<sup>2</sup>=Pearson Chi-square goodness of fit statistic; Entropy=entropy R<sup>2</sup> statistic (Vermunt & Magidson, 2013, p. 71)

The table below presents the mean scores for the eight indicators of Spiritual Well-Being for the two latent classes identified in the analysis. The mean scores highlight the distinct profiles of each class, illustrating key differences in how individuals relate to their spiritual well-being. These contrasting patterns provide a deeper understanding of the diverse ways individuals experience and express their spiritual well-being.

Table 3 Mean of each indicator of Spiritual Well-Being according to their latent classes

Figure 2 visualizes the data from Table 3, highlighting the mean scores of the eight indicators of spiritual well-being across the two latent classes. This plot further emphasizes the distinctions between the " **Spiritually Reflective Seeker** " and " **Spiritually Grounded Optimist** " classes, illustrating the contrasting patterns in their responses. By plotting these indicators, the figure clearly shows how the classes differ not only in their overall spiritual well-being but also in specific indicators. This visual representation allows for a more intuitive understanding of the latent classes and underscores variations in spiritual well-being among the respondents.

Figure 2 Graph of each latent class on Spiritual Well-Being



### 3. Logistic Regression Analysis of Latent Classes

After identifying the two latent classes of spiritual well-being of the respondents, logistic regression analysis was employed to find out the effects of age and religious attitudes and experiences on class membership. The results have shown that both age and religious

attitudes and experiences significantly predicted membership in the latent classes of spiritual well-being.

The results indicate that older participants have a higher likelihood of being classified in Class 2, "**Spiritually Grounded Optimist**", compared to younger participants. The odds ratio of 1.016 ( $p < 0.01$ ) suggests that for each additional year of age, the odds of belonging to the "**Spiritually Grounded Optimist**" class increase by 1.6%. This small but statistically significant increase implies that age plays a consistent role in fostering a spiritually grounded and optimistic outlook.

In addition, participants with more positive religious attitudes and experiences are substantially more likely to be categorized in Class 2 ("Spiritually Grounded Optimist") than in Class 1 ("Spiritually Reflective Seeker"). The odds ratio of 3.029 ( $p < 0.05$ ) implies that individuals with positive religious attitudes have over three times the odds of being in the "**Spiritually Grounded Optimist**" class compared to those in the "**Spiritually Reflective Seeker**" class.

**Table 3** displays the logistic regression coefficients, standard errors, odds ratios, and p-values for each predictor variable.

**Table 3**

**Variables in the Equation**

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
Step 1 <sup>a</sup>	Religious Attitude and Experiences	1.120	.057	388.680	1	<.001	3.065	2.742	3.427
	Constant	-4.283	.219	383.447	1	<.001	.014		
Step 2 <sup>b</sup>	Age	.016	.002	71.647	1	<.001	1.016	1.012	1.020
	Religious Attitude and Experiences	1.108	.057	379.350	1	<.001	3.029	2.709	3.386
	Constant	-4.811	.230	438.999	1	<.001	.008		

a. Variable(s) entered on step 1: Religious Attitude and Experiences.

b. Variable(s) entered on step 2: Age.

The results suggest that spiritual well-being among respondents can be categorized into two distinct classes, namely "**Spiritually Reflective Seeker**" and "**Spiritually Grounded Optimist**" with age and religious attitudes significantly influencing class membership. The older an individual becomes and has more positive religious experiences, he/she will be more likely to be in the "**Spiritually Grounded Optimist**" class. These findings emphasize the role of demographic variable age in shaping spiritual well-being and provide a foundation for future research in this area.

The eight indicators of spiritual well-being play a vital role in this study. It is in these indicators that respondents were classified into two classes with the aid of Latent Class Analysis. These Latent Classes are the following: "**Spiritually Reflective Seeker**" and "**Spiritually Grounded Optimist**". The results of the Latent Class Analysis (LCA) exhibit clear separation between these groups based on their mean scores in terms of the following items:

"1. I have grown spiritually," "2. Because of the spiritual changes I've been through, I've changed my priorities," "3. I more often have a sense of gratitude," "4. I spend more time

thinking about spiritual questions," "5. In some ways, I think I am spiritually lost," "6. My faith has been shaken, and I am not sure what I believe," "7. I feel I've lost some important spiritual meaning that I had before," and "8. I try to avoid anger and bitterness in my heart."

The "**Spiritually Reflective Seeker**" class, characterized by lower scores in positive spiritual indicators, suggests moderate spiritual growth, curiosity and openness, ambivalence, and uncertainty. This subgroup indicates a person who is in their active, yet tentative, chapter of spiritual exploration and self-discovery. In distinction from the above class, the "**Spiritually Grounded Optimist**" class comprises those who have undergone deep spiritual growth and conversion, leading to a profound sense of gratitude and a shift in their priorities. They are deeply involved in spiritual reflection and display few symptoms of doubt or spiritual disaster. Their view on their spiritual journey is hopeful and confident, even when challenged with occasional doubts or emotional challenges.

The elbow plot analysis establishes the judgment to use a two-class model rather than three or four classes, as it supplies a balance between model fit and interpretability, avoiding redundant complexity without losing expounding power. This decision is further fortified by the lower BIC and AIC values for the two-class solution, which highlights the efficiency and parsimony of this model in explaining the data.

The logistic regression analysis has shown that both age and religious attitudes and experiences were significantly predicting membership in these two latent classes. Older individuals were more likely to belong to the "**Spiritually Grounded Optimist**" class, suggesting that age is a demographic variable that plays a role in mounting a more stable and positive spiritual orientation. Likewise, respondents with more positive religious attitudes and experiences were also more likely to be categorized in the "**Spiritually Grounded Optimist**" class. These findings align with previous research indicating that positive religious attitudes are associated with enhanced spiritual well-being and reduced spiritual conflict.

Likewise, the differences observed between the two classes suggest that spiritual well-being is not a uniform construct but rather consists of multiple dimensions that vary across individuals. The existence of a "**Spiritually Reflective Seeker**" class highlights the need for spiritual and psychological interventions that address specific struggles, such as experiencing doubt and conflict. The study also highlights the importance of adopting positive spiritual attitudes and experiences, particularly among younger individuals, to promote spiritual well-being.

In summary, the above findings contribute to the classification of spiritual well-being by identifying distinct subgroups within the population and the factors that influence their spiritual experiences. As a recommendation for future research, one should explore a longitudinal study of these latent classes and investigate other potential independent variables connecting spiritual well-being to enhance understanding of the spiritual health condition of Seventh-Day Adventist populations.

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## CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS

This paper offers valuable insight into the spiritual well-being of individuals by classifying two diverse latent classes: the "**Spiritually Reflective Seeker**" and "**Spiritually Grounded Optimist**." The results highlight the variety of spiritual experiences, demonstrating that factors such as age and religious attitudes and experiences significantly influence spiritual well-being. The identification of these classes underscores the need for tailored interventions that address the unique spiritual challenges faced by different groups. By spreading our understanding of the factors that shape spiritual well-being, this study lays the groundwork for future research aimed at fostering positive spiritual development and support across various populations.

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