The creation of the indexes

The Christian Life Survey computes scores on several indexes that identifies their spiritual foci, orientations, and scripture interaction. Results from previous years' administrations of the CLS were used to create a small set of questions with high reliability and validity. This document provides the analytical validity results for the indexes. If you are unfamiliar with the nature of factor analytical analyses a brief introduction is provided at the end of this document.

The creation of the spiritual focus indexes

The spiritual focus indexes include questions that asked participants to strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree with a wide variety of questions about their beliefs and activities. Because we are heavily influenced by Christian traditions that highlight the great commandments (Matthew 22:37-39) and the central role of the Bible (e.g., 2 Timothy 3:16) most of the questions explored those aspects of the Christian life and so it is not surprising that these three aspects of the Christian life showed up in the analyses. When the questions were factor analyzed three dimensions were identified which we call the focus on God, the focus on others, and the focus on the Bible.

Here are the questions that loaded into the focus on God index (if you're not a statistics person the "factor loadings" won't mean anything to you—they are there for the statistics people):

Question participant was asked to agree/disagree with:	Factor loading
I believe in Jesus	0.754
I believe the God of the Bible is the one true God—Father, Son, and Holy Spirit	0.692
What God says is what is true, right, and good.	0.623
I believe God is actively involved in my life	0.521
I know my mission in life is to participate in the Kingdom of God.	0.496
I want God to be pleased with me	0.488
I have a personal relationship with Jesus	0.486
Index reliability coefficient (Cronbach's alpha):	0.83

Here are the questions that loaded together into a focus on others index (if you're not a statistics person the "factor loadings" won't mean anything to you—they are there for the statistics people):

Question participant was asked to agree/disagree with:	Factor loading
I live in ways that help others as much as myself	0.666
I have tremendous love for people I don't know	0.626
I go out of my way to discover the people in need around me that I normally wouldn't see	0.621
I use what I own for others as much as for myself	0.595
I think about others' well-being and want what is best for them	0.528
I rejoice with those who rejoice no matter how I personally feel	0.479
Index reliability coefficient (Cronbach's alpha):	0.77

Here are the questions that loaded together into a focus on the Bible index (if you're not a statistics person the "factor loadings" won't mean anything to you—they are there for the statistics people):

Question participant was asked to agree/disagree with:	Factor loading
As I go through the normal day I think of Bible passages relevant to what I am doing	0.663
I talk about Bible passages with my friends	0.561
I believe the Bible has decisive authority over what I say and do	0.421
Index reliability coefficient (Cronbach's alpha):	0.77

The creation of the spiritual orientation indexes

The spiritual orientations indexes include questions that asked participants to use a nine point scale that ranges from never, through yearly, monthly, and weekly, to daily to identify the frequency that they practice particular spiritual behaviors. When the questions were factor analyzed four dimensions were identified which we call the connectedness orientation (connected to God and other Christians), the outreach service orientation, the outreach evangelism orientation, and the reflective orientation.

Here are the questions that loaded into the connectedness orientation (if you're not a statistics person the "factor loadings won't mean anything to you—they are there for the statistics people):

Question participant indicated frequency for:	Factor loading
I engage in fellowship with Christians	0.695
I attend worship services	0.635
I read the Bible	0.583
I worship God	0.496
I meet with a spiritual small group or spiritual mentor	0.471
Index reliability coefficient (Cronbach's alpha):	0.76

Here are the questions that loaded into the outreach service orientation (if you're not a statistics person the "factor loadings won't mean anything to you—they are there for the statistics people):

Question participant indicated frequency for:	Factor loading
I serve those in need	0.689
I help others who are in difficulty	0.655
I help people who are treated unjustly	0.595
I serve the people around me	0.581
I allow myself to suffer for a worthy cause	0.471
Index reliability coefficient (Cronbach's alpha):	0.81

Here are the questions that loaded into the outreach evangelism orientation (if you're not a statistics person the "factor loadings won't mean anything to you—they are there for the statistics people):

Question participant indicated frequency for:	Factor loading
I talk to non-believers in ways that I think will help them come closer to Christ	0.738
I try to evangelize others so they will become Christians	0.677
I go out of my way to be in contact with non-believers	0.648
I act in specific ways around non-believers so they might come closer to Christ	0.533
Index reliability coefficient (Cronbach's alpha):	0.82

Here are the questions that loaded into the reflective orientation (if you're not a statistics person the "factor loadings won't mean anything to you—they are there for the statistics people):

Question participant indicated frequency for:	Factor loading
I reflect on who God is	0.688
I reflect on what it means for me to be a Christian	0.665
I reflect on the meaning of prayer in my life	0.633
I reflect on the meaning of scripture in my life	0.622
I reflect on what is good and right	0.575
Index reliability coefficient (Cronbach's alpha):	0.84

The creation of the scripture interaction indexes

In the 2012-2013 administration of the CLS, a 48 question process was used to find the best questions for seeing how and where people interact with the Bible. Based on that analysis, a set of 12 questions was used in this administration as indexes of breadth of kind of interaction and breadth of context of interaction.

	Factor loading
How often do you read the Bible or hear it read… -While with friends	0.747
How often do you read the Bible or hear it read… -In private times	0.636
How often do you read the Bible or hear it read… -In a small group	0.634
How often do you read the Bible or hear it read… -In religious services (church, chapel, mass, etc.)	0.513
How often do you read the Bible or hear it read… -While with family	0.462
How often do you read the Bible or hear it read… -In classes	0.458
Index reliability coefficients (Cronbach's alpha):	0.75

	Factor loading
When you read or hear the Bible, which of the following do you tend to do? I apply the passage to my life	0.67
When you read or hear the Bible, which of the following do you tend to do? I put myself personally into the passage	0.642
When you read or hear the Bible, which of the following do you tend to do? I experience the presence of God	0.58
When you read or hear the Bible, which of the following do you tend to do? I connect the passage to my feelings	0.573
When you read or hear the Bible, which of the following do you tend to do? I think carefully about the meaning of the passage	0.523
When you read or hear the Bible, which of the following do you tend to do? I reflect on what the passage means for others and society	0.493
Index reliability coefficients (Cronbach's alpha):	0.84

The Use of Factor Analysis

When we constructed the earliest versions of the survey, we created large lists of questions for each section so we could see which questions were helpful and which ones were not. As each successive version of the survey has been constructed, those sets of questions have been repeatedly revised to create a refined set of questions that work together to help us measure specific dimensions of participants' spiritual lives.

The refining of the list is accomplished by putting the questions through a statistical technique called factor analysis that lets us use the patterns in participants' answers to find sets of questions that are all measuring some common underlying dimension of life. (These analyses were done using principle axis factor analysis with varimax rotation and used eigenvalues of 1 to identify factors rather than a predetermined numbers of factors.)

When this kind of analysis is done one of three things can happen to each survey question being considered: the question can load unequivocally in a single "factor" (which means the question only measures one dimension of reality), the question can load into more than one factor (which means the question measures more than one dimension of participants' spiritual lives), or the question might not load into any factor (which means the question is not helpful for creating an index). If a question loads on a single factor it is useful for an index, if it loads on multiple factors the analyst has to make some decisions based on the strength of the loadings, and if it does not load on any factors it is not useful for an index and is discarded. When the analyses were done, many questions were discarded because they did not help us measure a specific dimension of peoples' spiritual lives but most were used in an index.

An interesting strength of this kind of analysis, is that the participant's patterns of answers determine how we come to understand their spiritual lives. The analysis can only consider the specific parts of spirituality that questions are asked about, of course, but how those dozens of questions are combined into indexes is decided by the reality of the participants' lives as reported in their answers. The indexes we've created are a mathematical reflection of the reality participants' report for the areas of spiritual life we are considering. It is possible, using this kind of technique, that we will learn that the participants' spiritual lives have any possible number of dimensions whether that turns out to be one dimension or a dozen. How many dimensions are seen in the data tells us a lot about the reality these survey participants live in.

Indexes

When the factor analysis process has identified a set of questions that are all measuring one underlying dimension of the participants' lives, we create an index from those questions. Indexes are created by taking a person's responses to a set of questions and combining them. This provides an overall measure that generally "sees" more of the dimension being measured than any one question sees on its own. An index also protects against any particular person mis-answering a particular question since that single mis-answer is subsumed into a more reliable comprehensive index. To determine how well an index works as an overall measurement device (which is referred to as the index's reliability), a statistical tool called Cronbach's alpha is used to evaluate the way the questions all work together as one comprehensive measure. These alpha values can range from zero, which means the index is a total failure, to one, which means the index works perfectly. While indexes are sometimes used with alpha reliability values of 0.4 and higher, good indexes have at least an alpha of 0.6. The alpha reliability value for each index in the CLS is included with the lists of questions for that index shown above.