

## The Creation of the Indexes

The Christian Life Survey (CLS) included 251 questions about the participants’ spiritual lives. Three particular sections of questions were used in the construction of comprehensive indexes.

One set of 30 questions asked for the participants’ level of agreement or disagreement about their beliefs and self-perceptions. This collection of questions was analyzed to find the three focus indexes: focus on God, focus on others, focus on the Bible. The three indexes are independent of each other. They involve different questions and how a participant scores on one index does not affect how they score on the other indexes. This independence is true of all the indexes from the CLS.

Another set of 21 questions were analyzed to find which questions were appropriate to use as indexes that identify the students’ spiritual orientations: connectedness orientation, outreach orientation, ascetic orientation, reflective orientation. The orientation questions were all self-report questions focused on how frequently the participants engaged in particular spiritual behavior.

The third set of questions that was analyzed to find indexes included 48 questions about the kinds and social contexts of engagement with the Bible and they yielded 9 indexes: 4 indexes based on kind of interaction with the Bible and 5 indexes based on social context of interaction with the Bible.

The construction of each of these sets of indexes is explained further below after the presentation of the lists of questions used in each index.

### 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 aspects of 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
What God says is what is true, right, and good.	0.7
I want to obey God	0.694
I believe the God of the Bible is the one true God—Father, Son, and Holy Spirit	0.659
I believe in Jesus	0.659
I want God to be pleased with me	0.612
I believe God is actively involved in my life	0.609
I have a personal relationship with Jesus	0.605
I am drawn towards Jesus (I want to be with Him)	0.596
I know my mission in life is to participate in the Kingdom of God.	0.581
I believe that everything continues to exist only because of God	0.574
I believe that God rewards those who follow him.	0.459
Index reliability coefficient (Cronbach’s alpha):	0.93

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	0.651
I go out of my way to discover the people in need around me that I normally wouldn't see	0.644
I have tremendous love for people I don't know	0.605
I go out of my way to serve	0.592
I use what I own for others as much as for myself	0.586
I go out of my way to get together with and understand people who are different than me	0.56
I think about others' well-being and want what is best for them	0.529
I sacrifice my time, possessions and will to help others grow in their relationship with Christ	0.526
I make an effort to learn what life really is like for people who are different than me	0.497
I have tremendous love for people I know	0.446
I rejoice with those who rejoice no matter how I personally feel	0.414
Index reliability coefficient (Cronbach's alpha):	0.84

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
I believe the Bible has decisive authority over what I say and do	0.451
As I go through the normal day I think of Bible passages relevant to what I am doing	0.526
I talk about Bible passages with my friends	0.475
Index reliability coefficient (Cronbach's alpha):	0.75

## 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 orientation (which, interestingly found that the participants see helping the needy and evangelization as all one thing), ascetic orientation, and 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 worship God	0.659
I attend worship services	0.644
I engage in fellowship with Christians	0.633
I pray	0.597
I meet with a spiritual small group	0.406
Index reliability coefficient (Cronbach's alpha):	0.80

Here are the questions that loaded into the outreach 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	0.729
I go out of my way to be in contact with non-believers	0.651
I serve those in need	0.514
I act in specific ways around non-believers so they might come closer to Christ	0.492
I make personal sacrifices for my faith	0.432
I serve the people around me	0.408
Index reliability coefficient (Cronbach's alpha):	0.79

Here are the questions that loaded into the ascetic 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 practice important times of silence	0.605
I have times of solitude	0.518
I intentionally practice submission	0.399
Index reliability coefficient (Cronbach's alpha):	0.67

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 what it means for me to be a Christian	0.556
I reflect on the meaning of prayer in my life	0.555
I reflect on the meaning of scripture in my life	0.471
Index reliability coefficient (Cronbach's alpha):	0.82

## The Creation of the Scripture Engagement Indexes

The scripture engagement indexes include questions that asked participants to strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree with a set of 48 questions that considered both the social contexts of interaction with the Bible and kinds of interaction with the Bible. Eight kinds of interaction with the Bible were considered within six different contexts of interaction. The eight questions participants could agree or disagree with to indicate the kinds of interaction with the Bible they engaged in were:

- I try to connect the passage to my thoughts
- I try to connect the passage to my beliefs
- I reflect on what it means for me personally
- I try to connect the passage to my actions
- I try to connect the passage to my feelings
- I experience the presence of the Holy Spirit
- I reflect on what it means for other people and society
- I put myself personally into the passage

The participants were asked to indicate how much they agreed that they used those kinds of interaction with the Bible in six different contexts (so they answered those same eight questions six different times considering if they applied in different contexts). The six contexts that were considered were:

- When I am in a small group and we read or discuss a Bible passage...
- When I am with my family and we read or discuss a Bible passage...
- When I hear the Bible read or discussed in a worship service...
- When I am in a group of friends and we read or discuss a Bible passage...
- When I read or think of a Bible passage privately...
- When I hear the Bible read or discussed in a class...

Running an analysis on these 48 questions allows us to see which kinds of interaction with the Bible transcend context and which ones are context-specific. Of the eight kinds of interaction with the Bible considered, four transcended context (the questions for that kind of interaction for all or most of the considered contexts loaded together).

Here are the questions that loaded together for kinds of interaction with the Bible that transcended context (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 loadings			
When I am in a small group and we read or discuss a Bible passage...-I experience the presence of the Holy Spirit	0.787			
When I am in a group of friends and we read or discuss a Bible passage...-I experience the presence of the Holy Spirit	0.774			
When I am with my family and we read or discuss a Bible passage-I experience the presence of the Holy Spirit	0.731			
When I hear the Bible read or discussed in a worship service...-I experience the presence of the Holy Spirit	0.712			
When I read or think of a Bible passage privately...-I experience the presence of the Holy Spirit	0.694			
When I hear the Bible read or discussed in a class...-I experience the presence of the Holy Spirit	0.656			
When I am in a small group and we read or discuss a Bible passage...-I reflect on what it means for other people and society		0.727		
When I am in a group of friends and we read or discuss a Bible passage...-I reflect on what it means for other people and society		0.724		
When I hear the Bible read or discussed in a worship service...-I reflect on what it means for other people and society		0.689		
When I am with my family and we read or discuss a Bible passage-I reflect on what it means for other people and society		0.682		
When I read or think of a Bible passage privately...-I reflect on what it means for other people and society		0.651		
When I hear the Bible read or discussed in a class...-I reflect on what it means for other people and society		0.633		
When I am in a group of friends and we read or discuss a Bible passage...-I put myself personally into the passage			0.738	
When I am in a small group and we read or discuss a Bible passage...-I put myself personally into the passage			0.722	
When I hear the Bible read or discussed in a worship service...-I put myself personally into the passage			0.714	
When I read or think of a Bible passage privately...-I put myself personally into the passage			0.689	
When I am with my family and we read or discuss a Bible passage-I put myself personally into the passage			0.687	
When I hear the Bible read or discussed in a class...-I put myself personally into the passage			0.618	
When I am in a small group and we read or discuss a Bible passage...-I try to connect the passage to my feelings				0.692

When I am in a group of friends and we read or discuss a Bible passage...-I try to connect the passage to my feelings				0.679
When I hear the Bible read or discussed in a worship service...-I try to connect the passage to my feelings				0.661
When I read or think of a Bible passage privately...-I try to connect the passage to my feelings				0.649
When I am with my family and we read or discuss a Bible passage-I try to connect the passage to my feelings				0.606
Index reliability coefficient (Cronbach's alpha):	0.92	0.89	0.92	0.91

The questions for the other kinds of interaction with the Bible loaded together by context instead of kind which means these kinds of interactions with the bible are context based and are not general approaches to Bible interaction that transcend context. Interestingly, the questions for three contexts load independently which means those contexts are experienced differently as contexts for experiencing the Bible while two contexts' questions loaded together which indicates that the participants experienced them as equivalent for the purposes of Bible interaction. Here are the questions that loaded together for kinds of interaction with the Bible that were context dependent (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 loadings			
When I am with my family and we read or discuss a Bible passage-I try to connect the passage to my thoughts	0.712			
When I am with my family and we read or discuss a Bible passage-I try to connect the passage to my actions	0.704			
When I am with my family and we read or discuss a Bible passage-I try to connect the passage to my beliefs	0.704			
When I am with my family and we read or discuss a Bible passage-I reflect on what it means for me personally	0.676			
When I read or think of a Bible passage privately...-I try to connect the passage to my thoughts		0.729		
When I read or think of a Bible passage privately...-I reflect on what it means for me personally		0.675		
When I read or think of a Bible passage privately...-I try to connect the passage to my actions		0.67		
When I read or think of a Bible passage privately...-I try to connect the passage to my beliefs		0.662		
When I hear the Bible read or discussed in a worship service...-I try to connect the passage to my thoughts			0.576	
When I hear the Bible read or discussed in a worship service...-I try to connect the passage to my beliefs			0.537	
When I hear the Bible read or discussed in a worship service...-I reflect on what it means for me personally			0.546	
When I hear the Bible read or discussed in a worship service...-I try to connect the passage to my actions			0.589	
When I am in a group of friends and we read or discuss a Bible passage...-I try to connect the passage to my thoughts				0.676
When I am in a group of friends and we read or discuss a Bible passage...-I try to connect the passage to my beliefs				0.674
When I am in a group of friends and we read or discuss a Bible passage...-I reflect on what it means for me personally				0.669
When I am in a group of friends and we read or discuss a Bible passage...-I try to connect the passage to my actions				0.627

When I am in a small group and we read or discuss a Bible passage...-I reflect on what it means for me personally				0.622	
When I am in a small group and we read or discuss a Bible passage...-I try to connect the passage to my beliefs				0.611	
When I am in a small group and we read or discuss a Bible passage...-I try to connect the passage to my thoughts				0.601	
When I am in a small group and we read or discuss a Bible passage...-I try to connect the passage to my actions				0.589	
When I hear the Bible read or discussed in a class...-I try to connect the passage to my actions					0.703
When I hear the Bible read or discussed in a class...-I reflect on what it means for me personally					0.684
When I hear the Bible read or discussed in a class...-I try to connect the passage to my thoughts					0.661
When I hear the Bible read or discussed in a class...-I try to connect the passage to my beliefs					0.649
When I hear the Bible read or discussed in a class...-I try to connect the passage to my feelings					0.641
Index reliability coefficient (Cronbach's alpha):	0.92	0.90	0.90	0.93	0.90

## 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 mathematically 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 and we greatly prefer an alpha of .8 or higher. The alpha reliability value for each index is included with the lists of questions for that index shown above.

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#### Data Collection

In the spring of 2013, students at 13 Christian universities from across the United States were invited to complete a half-hour on-line survey that asked about their spiritual background, spiritual lifestyles, scripture engagement, love of and relation to God, love of others, and their Christian identity.

4,210 traditional-age full-time students participated. Responses to the survey were weighted for proportional representativity of gender and year in school.