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Accepting Evolution and Believing in God: How Religious Persons Perceive the Theory of Evolution

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A dissertation submitted to the faculty of
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Doctor of Philosophy

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ABSTRACT

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Students frequently hold an incorrect view of evolution. There are several potential barriers that prevent students from engaging evolutionary theory including lack of knowledge, limited scientific reasoning ability, and religiosity. Our research provides tools for overcoming barriers related to religiosity and diagnoses the barriers preventing students from fully engaging in learning the theory of evolution. This was a two-part study.

The first part of our study addressed two hypothesized barriers to learning evolutionary theory among members of The Church of Jesus Christ of Latter-day Saints (LDS or Mormon): (1) religious views stemming from incorrect understanding of the Church's neutral stance on evolution and (2) misunderstanding the theory of evolution. We measured the relationship between acceptance of evolution and knowledge of evolution, religiosity, and understanding of religious doctrine on evolution. Additionally, we measured the effect of including a discussion on religious doctrine in the classroom. Students in all sections, except for a control section, were taught a unit on evolution that included a discussion on the neutral LDS doctrine on evolution. Students enrolled in introductory biology for non-majors took pre, post, and longitudinal surveys on topics in evolution. We found significant relationships between knowledge, understanding of religious doctrine, and religiosity with acceptance of evolution. Additionally, an in-class discussion of he LDS doctrine on evolution helped students be more accepting of evolution.

In the second part of our study, we studied a broader population to analyze differences in acceptance of evolution based on religious affiliation and religiosity. Our study focused on the interaction of five variables and their implication for evolution education: (1) religious commitment (2) religious views (3) knowledge of evolution (4) scientific reasoning ability and (5) acceptance of evolution. We measured each of these among equal samples of Southern Baptists, Catholics, Jews, and LDS populations and analyzed them with traditional statistics and structural equation modeling. Our findings showed that religious affiliation, religiosity and creationist views effected evolution acceptance, but not knowledge or scientific reasoning.

These data provide compelling evidence that as students gain an accurate understanding of their religious doctrines and knowledge of evolution, they are more willing to accept the basic concepts of evolution. They also show diagnostic results that help educators better understand students' background and views. When educators better understand views that students hold, they are better able to design instruction for optimal learning.

Keywords: education, misconceptions, biology, STEM, evolution acceptance, creationism, religiosity, scientific reasoning, religion, denomination, religiosity, Catholic, Jewish, Mormon, LDS, Baptist

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CHAPTER 1

Influencing highly religious undergraduate perceptions of evolution: Mormons as a case study

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KEYWORDS: education, evolutionary misconceptions, biology, religion, religiosity, STEM, LDS, Mormon

ABSTRACT

Background: Students frequently hold an incorrect view of evolution. There are several potential barriers that prevent religious students, specifically, from engaging evolutionary theory in the classroom. This study focuses on two hypothesized barriers on learning evolutionary theory in a highly religious model population, specifically members of The Church of Jesus Christ of Latter-day Saints (LDS or Mormon): (1) religious views stemming from incorrect or inadequate understanding of the Mormon church's neutral stance on evolution and (2) misunderstanding of the theory of evolution. The LDS population at Brigham Young University provides the ideal setting for studying evolution education among religious individuals in a controlled environment. To ascertain the prevalence and effect of these barriers, we measured the relationship between acceptance of evolution and knowledge of evolution, religiosity, and understanding of religious doctrine on evolution in introductory non-majors biology courses. Additionally, we measured the

effect of including a discussion on religious doctrine in the classroom. Students in all sections, except for one control section, were taught a unit on evolution that included a discussion on the neutral LDS doctrine on evolution. Data was gathered pre, post, and longitudinally. Results: Our data demonstrate a positive relationship between knowledge and acceptance of evolution, a positive relationship between understanding of religious doctrine and acceptance of evolution, and a negative relationship between religiosity and acceptance of evolution. Additionally, when an in-class discussion was held addressing the LDS doctrine on evolution students became more accepting of the principles of evolution. Conclusions: These data provide compelling evidence that an accurate understanding of their religious doctrines and knowledge of evolution can lead to greater acceptance of the basic concepts of evolution among highly religious students.

INTRODUCTION

Evolution is the change in populations over time that has lead to the diversity of life on earth (Mayr 2001). Examining the world in the context of evolution is central to understanding the biological patterns and complexity found in nature. For example, the anatomical similarities shared by all mammals are best explained by the principle of common ancestry and the process of natural selection. Understanding (and accepting) the theory of evolution leads to greater improvements in agriculture, medicine, political decisions, etc. The United States falls short in understanding and acceptance of Darwinian evolution compared to other countries (Miller et al. 2006, Newport 2012). In general, US students have a fragmented and incorrect view of the theory (Rees 2007, Brewer and Gardner 2013). They also appear to be hindered in understanding and acceptance of evolution due to misconceptions (Battisti et al. 2010, Hawley et al. 2011, Foster 2012). This common rejection of evolution by the general population impedes the ability of students to truly understand and embrace nature (including their place in it) and biodiversity. While there are many papers that address various factors influencing acceptance of evolution (Sherkat 2011, Wiles and Alters 2011, Heddy and Nadelson 2013, Wiles 2014, Carter and Wiles 2014), we will focus on three primary variables: (1) ignorance/lack of knowledge about evolutionary theory, (2) religiosity and (3) understanding of religious doctrine.

Regarding the first variable, research has shown that students harbor many misconceptions concerning the theory of evolution (Nehm and Schonfeld 2007, Battisti et al. 2010, Hawley et al. 2011, Foster 2012). These misconceptions range from not understanding the specific details about foundational principles (e.g., genetic drift) to not comprehending the larger scale processes

(e.g., natural selection) and what evolution is in general (Rees 2007, Halverson 2010, Andrews et al. 2012, Athanasiou and Mavrikaki 2013, Brewer and Gardner 2013). To better understand how to aid students in overcoming these misconceptions, numerous quantitative assessment tools have been developed that differentiate elements of evolutionary theory in order to identify underlying fallacies that fuel misconceptions (Anderson 2002, Rutledge and Sadler 2007, Cotner et al. 2010, Price et al. 2014). Many of these instruments are measurements of knowledge, which take into consideration the number of misconceptions students have (e.g., Knowledge of Evolution Exam; Cotner et al. 2010).

The relationship between knowledge and acceptance of evolution has been widely studied, but no clear association has emerged (Rissler et al. 2014). Robbins and Roy (2007) found change in evolution acceptance after limited instruction, while others found that change in acceptance associated with increased knowledge happened only for those who were initially undecided on the topic (Wilson 2005, Ingram and Nelson 2006). Conversely, others have found that improvement in knowledge does not lead to increased acceptance of evolution (Lawson and Worsnop 1992, Crawford et al. 2005, Cavallo and McCall 2008). Interestingly, Nadelson and Sinatra (2010) showed that acceptance of evolution can increase even when knowledge does not. When the relationship between knowledge and acceptance of evolution has been researched outside of the US, where there is less tension between evolution and religion, studies have found that increased knowledge led to increased acceptance of evolution (Akyol et al. 2010, Kim and Nehm 2011, Ha et al. 2012).

The second variable we consider is religion. Given that the positive relationship between knowledge and acceptance of evolution may be diminished by religion, we discuss two underlying mechanisms concerning religion that influence acceptance of evolution: religiosity and understanding of religious doctrine (Andersson and Wallin 2006, Coyne 2012, Heddy and Nadelson 2013, Rissler et al. 2014). Religiosity, as addressed herein, is considered a commitment to respective religious practices centering on a belief in a higher being. Several studies show that the more religious students are, the less likely they are to understand evolution or have positive attitudes toward the topic (e.g., Lawson and Worsnop 1992, Meadows et al. 2000, Barnes et al. 2009, Moore et al. 2011). Coyne (2012) found that resistance to evolution is "uniquely high" in the US, and it is the high religiosity of the US that drives this opposition. For example, 60% of the general US public now accepts that humans have evolved (Masci 2009)), yet up to 92% of some religious groups still reject human evolution (Miller 2008). This suggests that religiosity is a large part as to why the US struggles in its acceptance of evolution.

The third variable we consider that influences acceptance of evolution is an understanding of respective religious doctrines (core set of beliefs/practices) concerning evolution. It may be difficult for religious individuals to accept the theory of evolution when they feel that the theory conflicts with the doctrine of their religion. Some religions do have doctrine that openly rejects the theory of evolution (Weeks 1999, Affirmation of Creation 2004). However, many religious groups do not have an inherent conflict between their doctrine and the theory of evolution, either having a neutral or affirmative stance toward evolution (Colburn and Henriques 2006, Kohut et al. 2009). Yet, many individuals who claim membership in these "accepting" religions still feel that evolution conflicts with their religious and therefore personal beliefs (Reiss 2009, Burton

2011, Hawley et al. 2011). It may be that individuals are not aware of their respective religion's overall view of evolution. Christian denominations vary greatly in acceptance of evolution. For example, Catholics are the most accepting as compared to other Christian denominations (Miller 2008). The current general acceptance among Catholics seems to date to 1950 when Pope Pius XII stated that the theory of evolution does not conflict with the beliefs of the Catholic Church (Mislin 2012). The majority of the doctrines from other denominations also do not directly conflict with evolutionary theory (Ludlow 1992, Religious Groups' Views on Evolution 2009, McKenna 2014). Yet, a survey conducted by the Pew Forum showed the majority of people belonging to Christian denominations reject the theory of evolution (Miller 2008). The Catholic Church is just one example of a religion whose doctrine is neutral, if not supportive, toward evolution yet many of its members still reject the theory. These results suggest that perhaps the majority of Christians who reject evolution do so on the basis of misconceptions and/or a misunderstanding of their own religious doctrine.

An Example from Latter-day Saints (LDS)

In order to investigate the relationship between knowledge and religiosity with acceptance of evolution, we chose to study a highly religious population. The LDS population provides an ideal model for studying the acceptance of evolution because 78% of the overall church membership is opposed to evolution (Miller 2008) even though there is no doctrine that openly rejects it. The LDS church is the fourth largest Christian denomination in the US and has over 15 million members worldwide (Pew Research Center 2015).

Regarding the origin of humans, the presiding body of the LDS church has made three official statements (see methods below; Smith et al. 1909, Smith et al. 1910, Grant et al. 1925). There have been no official doctrinal statements addressing the theory of evolution. The clearest and most recent statement on evolution formally associated with the LDS church is in the *Encyclopedia of Mormonism*, which is approved by BYU's board of trustees (including the President of the church). Statements from this article assert that the LDS religion "is not hostile to real science…that which is demonstrated, we accept with joy" and, "the scriptures tell why man was created but they do not tell us how" (Ludlow 1992). From these statements it is clear that the LDS religion maintains strict belief in God as the creator. However, the church does not specify how the creation was accomplished, nor does it confirm or deny the potential for evolutionary creation (i.e., theistic evolution), and the language of these existing statements make allowances for scientific interpretation. Even though LDS church doctrine holds a neutral stance towards evolution, the vast majority of LDS members reject the theory of evolution (Miller 2008).

The LDS student population at Brigham Young University (BYU) is an ideal system to investigate the questions outlined below because the population is relatively homogenous in religious commitment, moral views, age and life experience. Over 98% of BYU students are LDS. The student body is ranked as the most religious in the US (Hafiz 2014), and offers a unique model for researching evolution education. The views of the BYU student body towards evolution also reflect those of the general Mormon population (see discussion). The LDS church sponsors BYU and urges that course subjects, including the theory of evolution, be taught with

the same subject matter, rigor and data as other universities across the US (BYU Mission Statement; see Appendix C).

Research Questions

This research examines the influence of three factors influencing LDS student acceptance of evolution: knowledge of evolution, religiosity, and comprehension of the neutral LDS position on evolution. We have four main research questions:

1. Is there a relationship between conceptual understanding of evolutionary theory and acceptance?
2. Is there a relationship between religious commitment (religiosity) and student acceptance of evolution?
3. Does an understanding of LDS doctrine concerning evolution affect the acceptance of evolution among LDS students?
4. Can instructors influence LDS student acceptance of evolution by helping them understand the specific religious doctrine on evolution?

METHODS

Approval from the BYU IRB was obtained for this research prior to data collection (IRB X110455).

Study Population

The LDS population at BYU provides the ideal setting for studying evolution education among religious individuals in a controlled environment. Brigham Young University is a LDS sponsored private institution that promotes teaching religious principles in every subject. Because discussion of religion is encouraged in the classroom, we have controlled the presence of religious discussion in general biology classrooms and measured the effects of such a discussion on student knowledge and acceptance of evolution.

Sampling

We sampled undergraduate students enrolled in introductory biology for non-majors at BYU, Provo, UT.

We administered surveys measuring conceptual understanding, religiosity, understanding of religious doctrines, and student acceptance of evolutionary theory among LDS students. Over 1500 complete responses were collected over the course of two semesters from two sections during winter (January-April) and 11 sections during fall (September-December) 2013 (see Table 1). All students surveyed were LDS and enrolled in an introductory course for non-majors that included a unit on evolution. We recognize that the results reported herein may be influenced by several factors such as curriculum design. However, our large sample size should

serve to mitigate many of these issues. The composition of the introductory biology sections was 58% freshman, 25% sophomores, 11% juniors, and 6% seniors as the introductory biology course is a general education requirement and can be taken at any point during the undergraduate studies. To measure retention of knowledge and acceptance, a longitudinal survey was sent to all students five to seven months after completing the course.

Table 1. Number of Complete Responses to Semester and Follow-up Surveys

Semester Surveys	Six-Month Follow-up Survey
Winter 2013	September 2013
N=234	N=72 (30.8%)
Fall 2013	July 2014
N=863	N=201 (23.3%)

Course Intervention and Control Group

To determine if we could influence acceptance by targeting misconceptions about LDS religious doctrine, we used a quasi-experimental design comparing sections where religious doctrine was addressed (treatment condition, n = 1104) to a section in which it was not addressed (control condition, n = 101). We administered the same dependent measures to each section and compared them.

Teaching the LDS stance on evolution. During the course of the semester, all but one of the introductory biology sections (control) included at least part of one lecture that presented and discussed the official church stance on human origins via the "BYU Evolution Packet" (http://www.ndbf.net/010.pdf). This packet presents the official LDS church statements regarding human origins and is comprised of an introduction to the packet and its history, a series of statements made by the presiding body of the church, and a statement from the Encyclopedia of Mormonism. During this lecture, designed more like a discussion, students were

allowed to ask questions and make comments. This formal discussion took up to one lecture period (50-75 minutes); there are 28 or 42 lecture periods (2100 minutes) for introductory biology during a BYU semester, depending on whether a class meets two or three times a week. The control treatment had access to the BYU Evolution Packet if they desired to look it up on their own, but no time was set aside to address or discuss it. There is no way of knowing whether students in the control section accessed it or not. During the time the treatment sections devoted to discussion of the official LDS stance on evolution, the control section continued with standard evolution content.

Teaching evolution. Students in both the treatment and control groups were taught a unit on evolution (4-8 lectures). Specifically, students were given evidences (biological observations) explained by evolution and were exposed to a variety of evidences such as morphological similarities across organisms, vestigial traits, fossils, a common genetic code, phylogenetics, etc. They were also taught about the processes of natural selection, genetic drift, gene flow, non-random mating and mutation as mechanisms for evolution. Overall, the unit on evolution for both the treatment and control groups represented the standard topics and materials covered in a typical introductory biology text.

Instruments

Students in both treatments were sent links to the following web-based surveys via email from K. Manwaring (author). Incentives for survey response depended on the instructor and included assignment credit or extra credit. Feedback on surveys was not provided to students after any of the administrations of the survey.

The Knowledge of Evolution Exam (KEE; Cotner et al. 2010*).* The KEE was used to test our first research question, as it is a measure of conceptual knowledge. This instrument was developed as

a concept inventory for evolution. Student answers were scored dichotomously (correct or incorrect) and then summed for this ten-item instrument. This instrument was administered as a pretest at the beginning of the semester and a posttest at the end. It was also included in the longitudinal survey.

1. Religiosity and Demographic Survey (Appendix A): The religiosity instrument was used to test our second question, which addresses religious factors that influence acceptance of evolution. For this survey, students answered general demographic questions as well as questions regarding the frequency of their religious practices. Questions regarding religiosity (7,9,12,16,19) each had five response categories and were summed to provide an overall measure of religiosity. A factor analysis was performed on these five items for validation that these questions measure the same variable in respondents. The remaining questions, which differed in the number of response categories, were scored individually and used as grouping variables in analyses. This was administered once during the semester.
2. Understanding of the LDS Stance on Evolution (ULSE; Appendix B): After conducting surveys during the winter 2013 semester, we saw a need to measure student understanding of the LDS stance on evolution. Thus, a new instrument was created and administered during the fall 2013 semester. It is comprised of questions assessing student understanding of the LDS stance on evolution (ULSE). This was used to test our third question regarding students understanding of their respective religious doctrine regarding evolution. This is a 3-item instrument, with six response categories for each question (strongly disagree to strongly agree; Appendix B). A factor analysis was performed on these three items for validation that they measure the same variable in respondents (that is

understanding of the LDS stance on evolution). Scores were computed by summing responses to each individual question. This instrument was administered as a pretest at the beginning of the semester and a posttest at the end. It was also included in the longitudinal survey for the fall 2013 respondents.

3. Measurement of Acceptance of the Theory of Evolution (MATE; Rutledge and Sadler 2007): We used this survey as our dependent measure—a measure of the acceptance of evolution. This survey addresses attitudes toward topics such as the scientific validity of evolution, human evolution, evidence of evolution, and the scientific community in general. This 20-item instrument (with six response categories ranking from strongly disagree to strongly agree) was administered as a pretest at the beginning of the semester and a posttest at the end. It was also included in the longitudinal survey. Though the MATE has been previously validated (Rutledge and Sadler 2007), a factor analysis was performed on the MATE, per the suggestion of Wagler and Wagler (2013) to validate an instrument each time it is administered to a new unique population. Scores were computed by summing responses to each individual question. Totaled scores were assigned a relative category (see Table 2) as done in Wiles and Alters (2011).

Table 2. Categories of Relative Acceptance of Evolution.

Relative Acceptance Category	MATE Score	MATE #1 Response Breakdown	MATE #2 Response Breakdown
Very high acceptance	107 - 120	61 (5.5%)	266 (23.8%)
High acceptance	92 - 106	192 (17.2%)	367 (32.9%)
Moderate acceptance	78 - 91	357 (32.0%)	282 (25.2%)
Low acceptance	64 - 77	327 (29.3%)	158 (14.1%)
Very low acceptance	20 - 63	117 (10.5%)	31 (2.8%)

Table 2 Description. MATE #1 and MATE #2 response breakdowns represents the number of students who fell in each category at the beginning and end of the semester, respectively.

Analyses

Using SPSS v. 21 (IBM, [Armonk, NY]), we ran a series of traditional statistical analyses to address our research questions. First, to determine which factors (conceptual understanding, religious factors, or doctrinal understanding) predicted an overall acceptance of evolution, we ran a general linear model (GLM) multiple regression analysis with the KEE, demographic factors, our religiosity measure, and the ULSE as predictors of the MATE (see Table 3 for complete list of variables entered into model). Items were entered stepwise into the model with an entry of a .05 p-value and a removal of a .10 p-value.

Table 3. Predictors of Initial Acceptance of Evolution

		Unstandardized Coefficients		Standardized Coefficients		
Final Model	Correlation with MATE (R)	B	Std. Error	Beta	t	Significance
ULSE #1	.475	1.844	.137	.419	13.462	< .001
KEE #1	.312	1.345	.209	.199	6.438	< .001
Controversial Topics	.250	2.415	.425	.172	5.677	< .001
Religiosity Scale	-.157	-0.967	.190	-.154	-5.082	< .001

Table 3 Description. Excluded (non-significant) variables are: instructor, class day, time of class, gender, biology experience, year in college, family income, parent education, health, parent religiosity, involvement in clubs, church mission experience, and family religious affiliation.

To analyze change in knowledge of evolution and acceptance of evolution we compared pretest, posttest, and longitudinal scores on the KEE and the MATE, using repeated measures ANOVAs and the frequency distribution of the relative MATE categories. To measure an increase in understanding of religious doctrine and acceptance of evolutionary theory, we compared pretest, posttest, and longitudinal scores on the ULSE and MATE using repeated measures ANOVAs.

To assess the success of discussing religious doctrine in clarifying understanding of doctrinal stance and increasing acceptance of evolution, we compared the change in evolution knowledge (KEE), doctrinal understanding (ULSE) and acceptance of evolution (MATE) between treatment and control sections using an independent one-way ANOVA analysis.

RESULTS

Reliability and Validity of Scales

From our exploratory factor analysis of the religiosity items, we recovered one factor with an eigenvalue much above the rest. This factor explained 46.45% of the variance. The scale had an acceptable level of internal consistency, as determined by a Cronbach's alpha of .677.

From our exploratory factor analysis of the ULSE instrument, only one factor was extracted. This factor explained 62.29% of the variance. The scale had an acceptable level of internal consistency, as determined by a Cronbach's alpha of .693.

From our exploratory factor analysis of the MATE items, we recovered four factors with an eigenvalue above 1. However, the first factor explains 46.84% of the variance and the next factor only explains an additional 6.97%. In addition, when examining the factor rotation, all items loaded highest on the first factor with all loadings exceeding .5, with the exception of one, which had a loading of .488. The scale had a high level of internal consistency, as determined by a Cronbach's alpha of .915.

Change in Evolution Acceptance

From a frequency distribution, the majority of students had moderate to low acceptance of evolution at the beginning of the semester (see Figure 1). By the end of the semester there was a significant gain in evolution acceptance ($p < .001$, see Figure 2), which resulted in the majority of students having high acceptance of evolution.

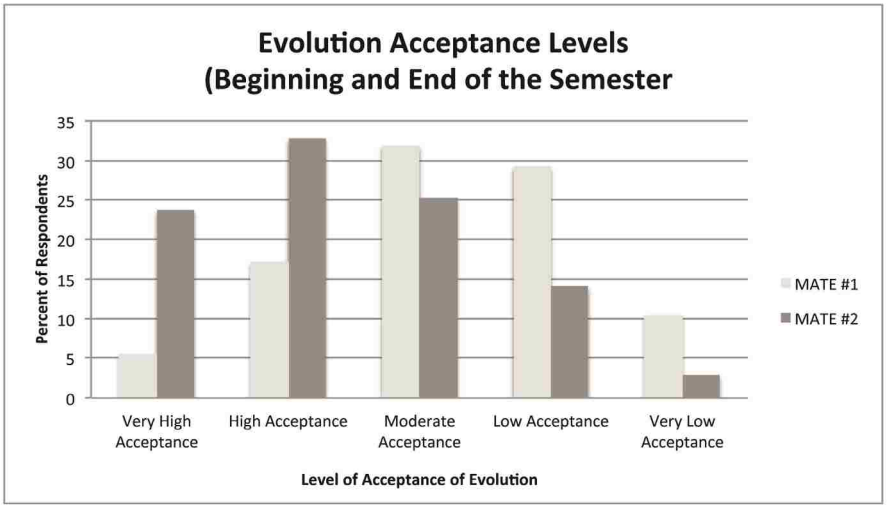

Figure 1. Evolution Acceptance at Beginning (MATE#1) and End (MATE #2) of the Semester

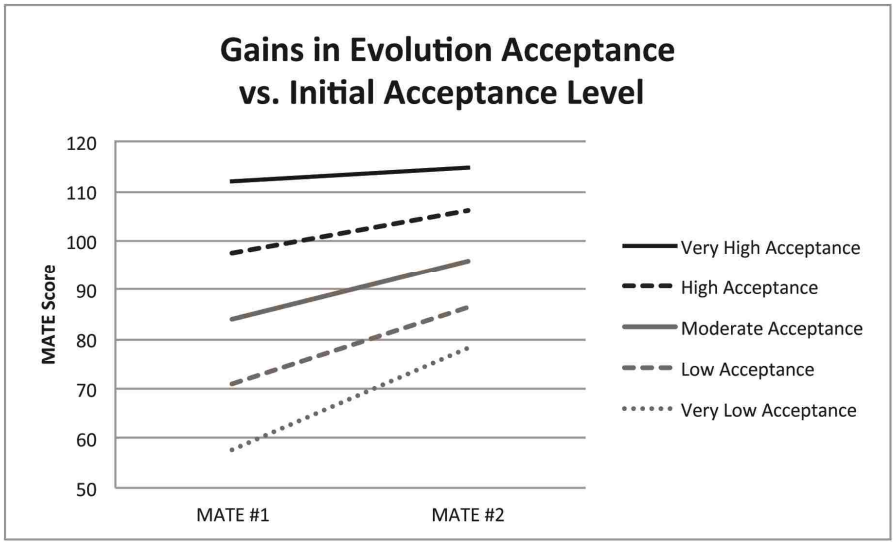

Figure 2. Gains in Evolution Acceptance vs. Initial Acceptance Level

Predictors of Initial Acceptance

Our results show that knowledge of evolution (KEE), understanding of LDS doctrine (ULSE) and religiosity significantly predict initial acceptance of evolution (MATE; F (4,748) = 91.530, p < .001; see Table 3). Only religiosity and evolution acceptance were negatively correlated, with a Pearson Correlation of -.157 *(*p <.001, see Table 3 for additional statistics). All slopes were fixed as section type (i.e., control vs. treatment) was not taken into consideration for this part of the analyses. See Table 3 for additional factors entered in the GLM regression and final model outcome.

Relationship Between Knowledge and Acceptance

From the GLM multiple regression analysis, knowledge of evolutionary theory (KEE score) was a significant predictor of initial attitude toward evolution (see Table 3). For every point gained in understanding (on a 10-point scale) acceptance increased by an average of 1.35 (on a 120-points scale).

A repeated measure ANOVA tested for significant gains over time in student knowledge and in student acceptance of evolution as well as for an interaction between KEE and MATE scores. Students demonstrated significant gains in knowledge (KEE; F (1,1051) = 70.64, p < .001; see Table 4 for averages) and in acceptance of evolution (MATE; F (1,1053) = 1009.45, p < .001; see Table 4 for averages). The interaction between the gains in the MATE and the gains in the KEE was also significant (F (1,1050) = 945.76, p < .001), meaning that students who increased in knowledge (KEE) the most during the semester saw the greatest gains in acceptance of evolution (MATE).

Table 4. Descriptive Statistics of Within Semester Results.

	N	Min	Max	Mean	Std. Dev.	Significance (2-tailed)	95% Confidence Interval
MATE #1	1054	37	120	81.09	14.74	<.001	80.20 – 81.98
MATE #2	1104	43	120	93.75	15.72		92.82 – 94.68
KEE #1	1053	0	10	6.14	1.964	<.001	6.02 – 6.25
KEE #2	1103	0	10	6.61	1.959		6.49 – 6.72
ULSE#1	821	3	18	12.21	3.075	<.001	12.00 – 12.42
ULSE#2	869	3	18	13.79	2.91		17.72 – 18.16

Table 4 Description: Significance and 95% CI are results of t-tests comparing the pre to post survey averages of each instrument.. #1 indicates the responses collected at the beginning of the semester (pre survey); #2 indicates the responses collected at the end of the semester (post survey).

A repeated measure ANOVA comparing the longitudinal survey to the post semester survey showed there was a significant decrease in knowledge over the 5-7 months after the course (KEE; F (1,283) = 28.9, p < .001; see Table 5). There were no significant changes in the MATE between the post semester survey and longitudinal survey.

Table 5. Descriptive Statistics of Students that Responded to the Longitudinal Survey.

	N	Min	Max	Mean	Std. Dev.	95% Confidence Interval
MATE #1	273	40	120	83.32	15.60	77.67 – 81.84
MATE #2	273	50	120	95.26	15.14	88.42 – 92.65
MATE #3	273	50	120	95.52	15.90	88.25 – 92.75
KEE #1	273	0	10	6.27	1.88	5.86 – 6.39
KEE #2	273	0	10	6.81	1.93	6.31 – 6.88
KEE #3	273	0	10	6.48	1.87	6.11 – 6.67
ULSE #1	177	8	18	13.79	2.40	13.44 – 14.16
ULSE #2	177	7	18	14.21	2.63	17.56 – 18.46
ULSE #3	201	3	18	13.52	3.13	17.62 – 18.67

Table 5 Description: #1 indicates the responses collected at the beginning of the semester; #2 indicates the responses collected at the end of the semester; #3 indicates the responses collected in the longitudinal survey. Acceptance of evolution and understanding of LDS doctrine on evolution remained higher after the semester is over while knowledge of evolution decreased.

Relationship Between Understanding of Religious Doctrine and Acceptance

From the GLM multiple regression analysis, another predictor of acceptance of evolution (MATE score) was degree of understanding of the LDS stance on evolution (ULSE score; see Table 3). For every 1-point increase in understanding of doctrine (on an 18-point scale), the MATE increased 1.84 points (on a 120-point scale).

A repeated measure ANOVA detected significant gains over time in student understanding of the LDS stance on evolution (ULSE; F (1,820) = 2427.41, $p < .001$; see Table 4 for averages); however, this increase was not consistent across sections (discussed below for the control section). The interaction between the gains in the MATE and the gains in the ULSE was also significant (F (1,820) = 213.94, p < .001), indicating that students who increased most in the ULSE saw the greatest gains in the MATE as well.

A repeated measure ANOVA comparing the longitudinal survey to the post semester survey showed there was no significant change in understanding of the LDS stance on evolution (ULSE; Table 5).

Effectiveness of Treatment (Discussion of LDS Stance on Evolution)

A one-way ANO VA showed that students who participated in a discussion about religious doctrine had significantly higher average gains in acceptance (MATE) than students in the control section where a discussion was not held (F (1,1052) = 26.30, $p < .001$; see Figure 3). In addition, the students participating in the discussion had a greater average gain in understanding

of LDS doctrine (ULSE) than students who did not (F (1,820) = 15.19, $p < .01$; see Figure 3b). Interestingly, these gains in acceptance and understanding of religious doctrine did not correspond to an increase in understanding of evolutionary theory. Students in the section without discussion of LDS doctrine gained more knowledge on average than sections that did have a discussion (F (1,1050) = 6.59, $p < .01$; see Figure 3c).

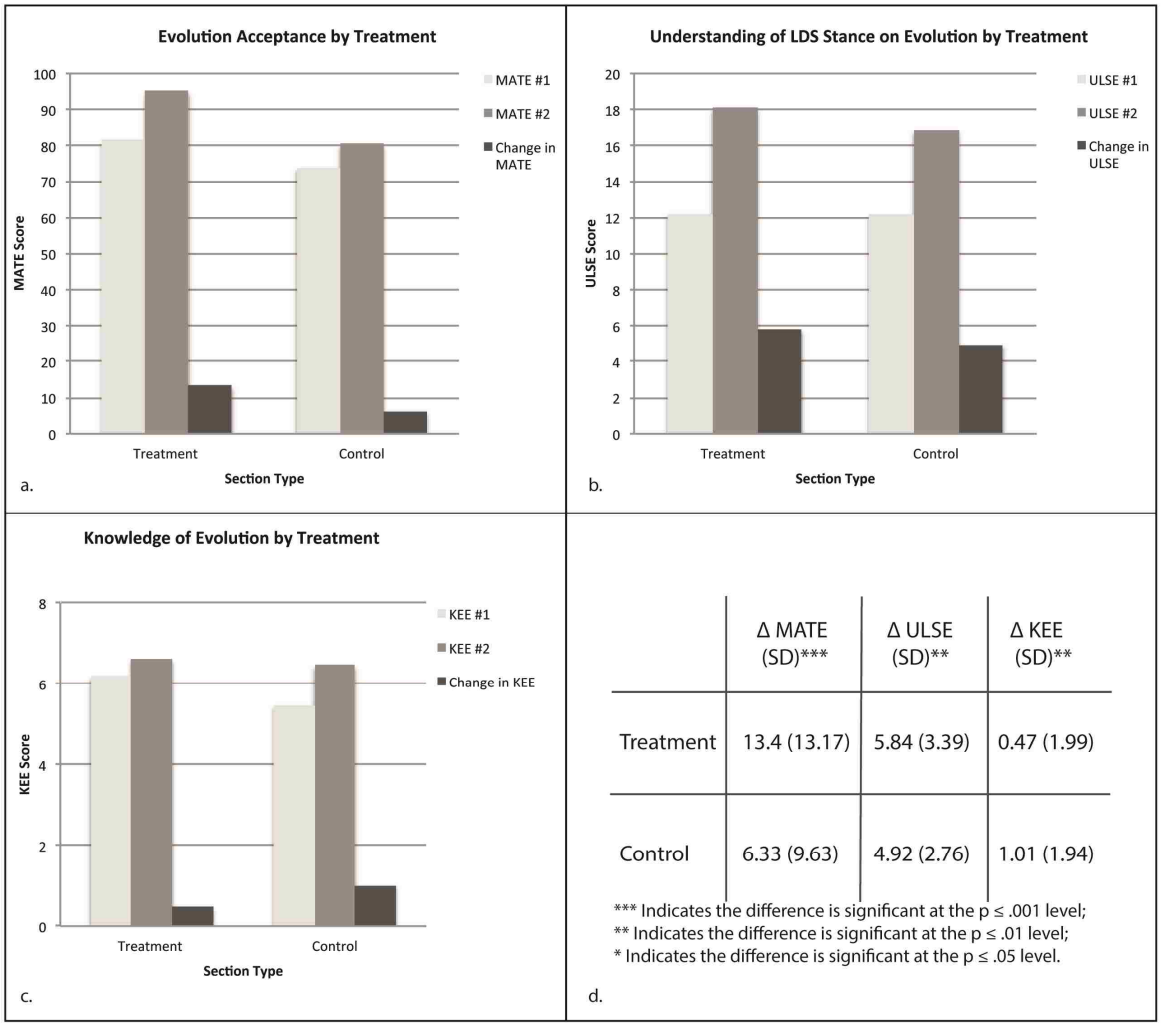

Figure 3. Treatment vs. Control Group in Changes in Acceptance, Understanding of Religious Doctrine, and Knowledge of Evolution*: (a) Pretest, posttest, and change in acceptance of evolution (MATE) for the treatment vs. control sections. The change in acceptance was significantly more for the treatment sections (see part d. of same figure). (b) Pretest, posttest, and change in understanding of LDS doctrine (ULSE) for the treatment vs. control sections. The change in ULSE was significantly more for the treatment sections (see part d. of same figure). (c) Pretest, posttest, and change in knowledge of evolution for the treatment vs. control sections. The change in knowledge was significantly more for the control section (see part d. of same figure). (d) Statistics and significance level for the previous three sections of the figure.*

DISCUSSION

This study explores three variables and their possible relationship with acceptance of evolution among religious students. These variables are: knowledge of evolution, religious practices, and knowledge of religious doctrine. In addition, we measured changes in the acceptance of evolution following a discussion dedicated to LDS doctrine and evolution.

Overall, students increased substantially in their acceptance of evolution over the course of the semester (see Figure 2). At the beginning of the semester, only 22.7% of students were highly supportive (accepting) of evolution, while 39.8% of students were dismissive (Figure 1). The remaining students fell into the moderately accepting category. Thus, the BYU student body is representative of the overall US LDS church membership regarding acceptance of evolution (22% acceptance rate; Miller 2008). While the perceived disagreement between religion and evolution continues, educators should be encouraged by student ability to learn and change perspective. By the end of the semester 56.7% of students were very highly accepting or highly accepting of evolution, a significant increase of 34% ($p < .001$) from the beginning of the semester. Thus, even though a low percentage of students initially accepted evolution at a high level, there were even fewer students who dismissed it by the end (see Figure 1).

We also found that with explicit instruction, there is a significant increase in knowledge of evolution. This is a logical and expected result (Cotner et al. 2009, Kim and Nehm 2011, Moore et al. 2011). In general, students respond well (via increase in knowledge) when evidence of evolutionary theory is provided and specific misconceptions are targeted (Wiles 2014, Moore et

al. 2011). Obviously educating students on evolution will improve their understanding of it, but some studies show this is only true for the least religious students (Moore et al. 2011, Kahan 2014, Rissler et al 2014). Our data show no significant relationship between religiosity and gains in knowledge of evolution. Instead, students made significant gains in knowledge of evolution regardless of religiosity.

Is there a relationship between conceptual understanding of evolutionary theory and acceptance?

Many have found a positive relationship between knowledge and acceptance of evolution (Wilson 2005, Ingram and Nelson 2006, Robbins and Roy 2007), while others have not (Lawson and Worsnop 1992, Crawford et al. 2005, Cavallo and McCall 2008). We found a positive relationship between knowledge of evolution and acceptance of evolution (see Table 3). In addition, as students with an incorrect or limited understanding gained greater competency with the theory of evolution (defined as being able to correctly comprehend major evolutionary tenets) they also became more accepting of it (see Figure 3a & 1c).

Is there a relationship between religious commitment (religiosity) and student acceptance of evolution?

Our data show that religiosity does affect their initial willingness to accept evolution. We found a negative relationship between overall religiosity and acceptance of evolution (Table 3). The items used in our measure of religiosity (e.g., frequency of prayer, church attendance, belief in an afterlife, etc.; see Appendix A) show that religiosity itself may be a causative factor in low acceptance of evolution. These findings are in line with numerous, previous research articles

(e.g., Andersson and Wallin 2006, Coyne 2012, Heddy and Nadelson 2013, Rissler et al. 2014). Student religiosity did affect the initial acceptance rate of evolution (Table 3), but it did not hinder students from increasing in acceptance of evolution by the end of the semester. Students who were initially the least accepting of evolution had a significant increase in acceptance. We found that religiosity was a significant positive predictor *($p < .001$)* of change in MATE and that the more religious an LDS individual ranked the greater the gains in acceptance of evolution over the course of the semester. Even though we used normalized gains to remove a ceiling effect, it should be noted that it may be that the most religious students were initially the least accepting of evolution and had the most to gain. Nevertheless, although religiosity is a factor in initial acceptance of evolution, it does not prevent LDS individuals from learning or modifying their views.

Does an understanding of LDS doctrine concerning evolution affect acceptance of evolution among LDS students? And Can instructors influence LDS student acceptance of evolution by helping them understand the specific religious doctrine on evolution?

One novel result from this study was that as students learned more about their own religion and its doctrine on evolution, acceptance rates increased significantly *($p < .001$).* We found a positive relationship between student initial understanding of the LDS stance on evolution (ULSE) and initial acceptance of evolution (MATE; see Table 3).

We also found that as students with an incorrect or limited understanding of the LDS stance on evolution gained knowledge of LDS doctrine (via class discussion (Figure 3b). Students who did not participate in a discussion had greater gains in knowledge of evolution but had significantly

less gains in acceptance of it (see Figure 3d). The more misconceptions a student harbored regarding the LDS stance on evolution the less likely they were to accept the theory of evolution. In the control class, students made significantly smaller gains in their understanding of LDS doctrine on evolution (ULSE; Figure 3b & 1d). Not having a discussion focused on LDS doctrine could have impeded their ability to synthesize their understanding of evolution with LDS beliefs. Interestingly, Masci (2009) found that of the general U.S. public, people who attend worship services more frequently are less likely to perceive faith and science as conflicting forces. In conjunction with Masci (2009), our results suggest that some factors leading to higher acceptance of science could be familiarity with one's religion (as long at the religion is neutral or supportive to evolution), intellectual engagement and/or theological engagement. We demonstrate that when students recognize that LDS doctrine is neutral towards evolution and are able to actively discuss this point in a classroom setting, they become empowered to form positive viewpoints on evolution.

Longitudinal surveys show that students from both semesters retained the same degree of acceptance of evolution five to seven months following the end of class, while losing some knowledge of evolution. Nadelson and Sinatra (2010) showed that acceptance of evolution increases even when knowledge does not. We have shown that acceptance can be maintained even while knowledge decreases over time. This makes for potential concern as it seemingly produces students who have an ongoing favorable opinion/acceptance of evolution but cannot recall specific principles that support the theory. We speculate that students may not remember the details of what was being explained, but found the explanation compelling enough to increase their acceptance. Further, since the MATE questions focus on "big picture" ideas, it

may be easier for students to retain impressions of the correctness of the theory six months later while not being able to remember the more detailed nuances assessed by the KEE. The cause for an increase in the KEE score during the semester could be due to extrinsic motivation to learn evolution in order to get a better grade while their motivation for accepting is likely only intrinsic. Therefore, once the semester is over the facts pertaining to evolution are quickly forgotten while the attitudes remain intact because education that takes place by intrinsic motivation leads to sustained learning (Ryan and Deci 2000).

It may seem surprising that MATE scores increased beyond the end of the semester. This is most likely due to response bias. Only 30.8% and 23.3% of the students that took the surveys during the winter 2013 and fall 2013 semesters, respectively, took the longitudinal surveys. While incentives were offered to students who took the longitudinal surveys (entrance into a drawing), those who actually completed it may have been those who had more interest in the topic. Interestingly, we found that students who initially had higher acceptance of evolution were more likely to participate in the longitudinal survey than those who initially had low acceptance of it ($p < .01$).

Another interesting finding is that students seemed to retain knowledge of the LDS stance on evolution while forgetting specific knowledge of evolution. There are some limitations to this specific finding. The knowledge of the LDS stance on evolution was measured on a scale ranging from “strongly disagree” to “strongly agree,” while knowledge of evolution was measured with a dichotomously scored test where they either got each question right or wrong. Since student responses on the knowledge they retained toward the LDS stance on evolution

cannot be coded as right or wrong it is not possible to directly compare the retention of knowledge of the LDS stance on evolution with the retention of knowledge concerning evolution. However, we do find that knowledge of LDS doctrine remained while knowledge of evolution was lost.

Intriguingly, students who were not part of a discussion of LDS doctrine saw gains in knowledge of evolution that exceeded the treatment sections (Figure 3c). A possible explanation for this is that students in the control section spent time learning biology content while their counterparts were discussion religion. These discussions took up to 75 minutes, which is 3.6% of the total class time over the semester or 12.5-25% of the class time devoted to the unit on evolution. Other variables that may have influenced this greater gain in knowledge could be random sampling, instructor effect, or learning style.

Conclusions

We recognize there are other limitations to this study. Foremost, we understand that our conclusions were reached from an exclusively LDS population of students. The LDS church is unique in the way its worldwide congregations are united by and adhered to the same doctrine. However, this is also a benefit in such studies since attempting this same study among other religions would prove more difficult due to the variation between congregations and sects. Thus, the LDS population serves as a homogeneous representative sample of highly religious people. Despite any limitations of this study, the results and principles we found are compelling and lead to meaningful conclusions that can be applied to the classroom and future research.

Most student populations will have challenges, many unique, with accepting evolution. However, the challenges can be overcome with purposeful intervention, usually by creating cognitive dissonance for the students. For our study, we identified, diagnosed, and dealt with a barrier to evolution acceptance that was prevalent in our classrooms. Our student population had issues with accepting evolution due to lack of knowledge of their own religious doctrine, a challenge not unique to LDS students. At BYU, we were able to create a controlled environment to research this barrier and how to overcome it. We designed a meaningful intervention that led to significant increases in acceptance of evolution. Allowing LDS students to discuss and explore religious doctrine on evolution increased their willingness to accept it. We suggest that other educators struggling to help students understand or accept evolution can likewise find meaningful interventions to help overcome student reluctance toward evolution. One idea is for educators to allow students time in class to brainstorm what hesitations they have to accepting evolution, then direct them to research sources that support and contradict that hesitation. Whatever the intervention, we hope this gives instructors creative insight to how they may address barriers to evolution acceptance in their classroom.

For those educators interested in addressing the barrier of religion in evolution education, we assert that our results can likely be extended to other Christian denominations because the conflict between religion and evolution is relatively universal. We encourage educators to find ways for religious students to explore their respective religious doctrines towards evolution. We do not suggest that instructors necessarily take time out of class to discuss religion and science if they are not comfortable doing so or do not feel it appropriate for their students. However, we are suggesting that encouraging religious students to research their own religious doctrines may

prove valuable to student acceptance of the theory of evolution. For example, a resource for students may be The Clergy Letter Project, which is a conglomeration of over 13,800 signatures from numerous clergymen (including Christian, Jewish, and Buddhist clergy) who endorse statements supporting the compatibility of religion and science (including evolution; Zimmerman 2010). For educators who teach students with potential religious barriers, this may be a helpful tool for students to overcome reservations they may have about learning evolutionary theory. We suggest that this model will hold with students claiming membership to other Christian religions, which also have a neutral or favorable stance on the theory of evolution.

LIST OF ABBREVIATIONS

BYU: Brigham Young University

KEE: Knowledge of Evolution Exam

LDS: The Church of Jesus Christ of Latter-day Saints

MATE: Measure of Acceptance of the Theory of Evolution

ULSE: Understanding of the LDS Stance on Evolution

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CHAPTER 2

How acceptance of evolution relates to religiosity (and other factors) among Judeo-Christian religions

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KEYWORDS: evolution acceptance, religion, denomination, religiosity, Catholic, Jewish, Mormon, Baptist

ABSTRACT

Some of the biggest hindrances to evolution acceptance are religious factors. These include religious affiliation, religiosity (i.e., the degree to which individuals ascribe to and/or practice their religion) and views of creation. This study focuses on how religious affiliation and religiosity within that affiliation affect views of creation as well as overall acceptance of evolution. Additionally, we looked at how religious affiliation and religiosity affected knowledge

of evolution as well as acceptance of specific aspects of evolution. Over 700 religious adults were surveyed nationwide using a newly validated instrument. Respondents were selected on the basis of affiliation to one of four religions: Southern Baptist, Catholic, Jewish, or LDS (Mormon). Data were analyzed using structural equation modeling as well as variable association analysis. Data demonstrate creationism and evolution acceptance are negatively related and identify significant differences in acceptance of evolution and creationism based on religious affiliation. Religious affiliation also had an effect on acceptance of specific aspects of evolution and knowledge of evolution. However, religiosity is a major factor in determining acceptance of evolution and may be as strong as religious affiliation. Overall, Jews and Catholics are far more accepting of evolution than Mormons or Southern Baptists. The most accepted aspect of evolution among all religious affiliations was an old earth. These data provide compelling evidence that evolution is viewed differently based on both religious affiliation and religiosity. Educators should consider the religious demographic of their students when teaching evolution.

INTRODUCTION

The theory of evolution unites all biological disciplines. Without an understanding of evolution, it is difficult to explain most anything in nature. Hence, it is extremely important for biology students to accept and understand the theory and for instructors to grasp the challenges and nuances of teaching the subject to the students they teach. In comparison to 34 other countries, the US is next to last when it comes to acceptance of evolution (Miller et al. 2006). The US population displays a large degree of variance in both understanding and acceptance of evolution among students and the general population (Kohut et al. 2005; Miller et al. 2006; Pew Research Center 2013).

Religious belief is a specific factor that has been found to correlate with the low acceptance rate of evolution (Miller 2008). Evolution has been a controversial topic for religious people for over a century, especially in the United States (Miller et al. 2006, Drees 2012). Individuals from different religions accept evolution and the different components of the theory to different degrees based on how their respective religious doctrines. For example, among Eastern Religions (i.e., Buddhism and Hinduism) where there is little to no conflict with the theory, there is high acceptance; whereas most individuals affiliated with Christianity have a lower acceptance (Miller 2008). Further, among Christians there is a broad spectrum of acceptance toward evolution ranging from 58% of Catholics to only 8% of Jehovah's Witnesses (Miller 2008). Such disparity between religions and even among followers of the same religion that share fundamental similarities and beliefs may be an indication that religious affiliation is only one of many factors to influence acceptance. Other factors may include: religiosity (i.e., the degree to

which individuals ascribe to and/or practice their religion), creationist views, and knowledge of evolution.

One limitation of most previous research focused on evolution acceptance is that religiosity is measured with a single dichotomous item (e.g., religious or a-religious) or a non-validated scale to determine comparison groups is used (e.g., Lawson and Worsnop 1992, Village and Baker 2013, Rissler et al. 2014). As an example, a single question, "how important is religion in your life?" has been used to predict evolution acceptance (Heddy and Nadelson 2013). While single items can be correlated with longer scales (Nadelson and Sinatra 2009), a better practice is to use a scale instead of a single item to measure a latent variable such as religiosity (Gardner et al. 1998). Multiple-item measures (i.e, scales) of religiosity have been published (Roof and Perkins 1975, Altemeyer 1988, Sethi and Seligman 1993, Pfeifer and Waelty 1995) but have not been used to measure how religiosity might affect the acceptance of evolution. Research that uses a vali religiosity scale when testing the relationship between religiosity and acceptance of evolution is lacking (but see Hill 2014, Manwaring et al. 2015).

The purpose of this research was to test to what extent religious affiliation and religiosity predict knowledge and acceptance of evolution. This research is unique in that it addresses specific religious affiliations in respect to attitudes toward evolution, uses a more refined and validated scale of religiosity, and uses more inclusive analyses to explore how multiple factors may work together to influence acceptance of evolution.

Religiosity

It is important to define religiosity and discuss its relationship to evolution acceptance. Religions are defined by specific principles and/or beliefs that are to be obeyed (Schlehofer et al. 2008). The variance among individuals within a religion to adherence to such principles equates to the religiosity of an individual (Glock 1962, Schlehofer et al. 2008). For example, an individual can belong to a given religion without being religious or knowledgeable about the doctrines of that religion. Therefore, religious affiliation and religiosity are different. Hill (2014) found that the level of adherence an individual puts toward certain beliefs (i.e., their religiosity) influences how accepting they are of evolution. Overall, there is a pattern showing that the more strongly committed one is to their respective practices and beliefs, the lower their evolution acceptance (Baker 2013, Barone *et al*. 2014, Colburn and Henriques 2006, Newport 2010).

Doctrine on Creation

Religious doctrine regarding the creation of the world may be associated with the likelihood that an individual will accept evolution as a viable theory. However, this factor is not a simplistic categorization of a belief that a supernatural being created the earth. For example, the belief that God created the world is determined by how different religions and individuals within each religion interpret scripture (e.g., Old Testament) on the creation. For example, some interpret the scriptural account of the creation literally and believe that the earth and all its inhabitants were created in a six day period --144 hours. While others interpret the account of the creation more figuratively, reasoning that the earth could have been created in six periods of time over millions to billions of years. Those who are strongly committed to a figurative interpretation are more

willing to accept the data supporting the theory of evolution than those who take the scriptural account literally (Levesque and Guillaume 2010, Lloyd 2014).

Strict creationists tend to be adamantly opposed to evolution (Scott 1997). The literal interpretation of the creation has been a hindrance to the acceptance of evolution specifically because it has shaped what we teach in schools (Lawson and Weser 1990). A Pew Forum survey found that 38% of the public would prefer that creationism be taught instead of evolution (Kohut et al. 2005). Additionally, though legislation has repeatedly ruled that creationism should not be taught in schools (see *Epperson v. Arkansas* 1968, *Daniel v. Waters* 1975, *Edwards v. Aguillard* 1987, *Kitzmiller v. Dover Area School District* 2005), up to 20-35% of high school biology teachers still include creationism in their courses (Berkman et al. 2008). There is evidence that including creationism as a subject in the biology classroom has had a negative effect by convoluting what science is and hindering student acceptance of scientific theories and laws (Moore and Cotner 2009). Strict creationist views are a driving force for misconception among religious people and set up a dichotomy between belief in Supreme Being evolution acceptance (Scott 2004).

Evolution Acceptance and Creationist Views Based on Religious Affiliation

In this study we examine four specific religions with doctrines that are not overtly against evolution. Each shares a similar creation story yet they differ in the degree to which they align with literal creationism. Between major Judeo-Christian religions, Catholics and Jews are most accepting of the theory of evolution (77% and 58% respectively), while LDS (22%) and

Southern Baptists (24%) tend to be among the least accepting (Miller 2008). A look at the official doctrine on evolution for each religion follows.

Judaism. The majority of research shows that neither of the Jewish traditions or doctrine have major conflicts with the theory of evolution (Sternman 1994, Gitig 2005, Steinberg 2010, Cherry 2011). Further, Artson (2011) describes Judaism and evolution as "co-evolving" towards a greater degree of compatibility. Judaism and Christianity share a creation story; however, those who identify as Jewish accept evolution at a level that exceeds any Christian denomination by nearly 20% (Miller 2008).

Catholicism. Catholics are the most accepting of evolution among the Christian denominations surveyed (Miller 2008). In 1950, Pope Pius XII made a statement of neutrality toward evolution which left parishioners free to accept the theory if they desired (Mislin 2012). More recently, Pope Francis stated that, "evolution…is not opposed to the notion of creation" (McKenna 2014).

Mormonism. Over 75% of Mormons reject the theory of evolution. The religion has an impassioned history of religious leaders split on their opinions of the theory (Evenson and Jeffery 2005). However, the official LDS doctrine on evolution is neutral: "the scriptures tell us why man was created but they do not tell us how" (Ludlow 1992).

Baptist. Southern Baptists leaders have supported intelligent design (ID) as their creationist viewpoint (Southern Baptist Convention 1982) and rejected evolution (Weeks 1999, Lemke, 2012).

Creationist views range on a continuum including young earth creationism, intelligent design, theistic evolution, and materialistic/atheistic evolution. Where an individual falls on this continuum generally reflects their acceptance of modern science (Scott 1997). As an example, individuals with views that characterize them as young earth creationists (one extreme of the continuum) are more likely to be theologically conservative and minimally accepting of science (DeFord 1931), even to the point of rejecting that the earth is a sphere in extreme cases (Schadewald 1980, Schadewald 1991). Towards the other end of the creationist spectrum are those who believe in theistic evolution or that God relied on natural laws (including evolution), to bring about the diversity of life (Scott 1997). Theistic evolution accepts all components of the theory of evolution while maintaining a belief in God (Scott 1997). We refer to creationism and creationist views in the strictest sense (i.e., belief in creation excludes the possibility of evolution).

Other Factors Influencing Evolution Acceptance

While religious affiliation, religiosity, and creationist views are the main factors addressed in this paper, there are other factors that correlate with acceptance of evolution, including: knowledge of evolution, political affiliation, and scientific reasoning ability (e.g., Lawson and Weser 1990, Paterson and Rossow 1999; Heddy and Nadelson 2012*)*. For example, multiple studies have found that the more knowledgeable a person is about the theory of evolution, the more likely they will accept it (Akyol et al., 2010; Kim & Nehm, 2011; Ha, Haury, & Nehm 2012). Additionally, individuals may be antagonistic towards the theory but their religion holds a neutral stance on evolution (Manwaring et al 2015, Miller 2008). It may be that these individuals are unaware of their respective religious doctrines on evolution. As these individuals learn about

evolution and become familiar with their respective religious doctrines, they also become more accepting of the theory of evolution (Manwaring et al. 2015).

Research Hypotheses

In the literature, religiosity is always negatively correlated with acceptance of evolution (refs) but those who have public statements allowing followers to embrace evolution should show a shift toward acceptance. The goal of this research was to determine how religious affiliation and religiosity within that religion affects knowledge and acceptance of evolution. We hypothesized that three main factors, religious affiliation, religiosity and creationist views, affect acceptance of evolution. We also hypothesize that religious affiliation causes variations in religiosity, creationist views, knowledge of evolution, and acceptance of evolution (including acceptance of the various tenets of evolutionary theory).

METHODS

Approval from the BYU IRB was obtained for this research prior to data collection (IRB E14297).

Study Population

In order to study the relationships regarding religious affiliation/religiosity and acceptance of evolution, we used a Qualtrics Panel to survey 724 individuals from the general US population nationwide. Individuals were chosen on the basis of affiliation with one of four religions: Catholic, Jewish, The Church of Jesus Christ of Latter-day Saint (LDS or Mormon), or Southern

Baptist (see Table 1). To focus our research on the college aged population, 57% of the individuals surveyed were under the age of 25.

Instruments

The administered instrument was created and validated for the specific purpose of this study. It was intended to measure knowledge of evolution, religious commitment, creationist views, and evolution acceptance in order to examine the relationships between these factors as well as how they differ between religious affiliations. The instrument was divided into five parts (Appendix D*)*:

1. Demographic Questions. The demographic items were used as grouping variables in analyses. Some variables measured were religious affiliation, age, and college experience.
2. Knowledge of Evolution. These items were used to address the difference between religious affiliation in knowledge of evolution. Ten of the items were taken from the Knowledge of Evolution Exam (Cotner et al. 2010) and four more were added by the authors to address knowledge of human evolution. Answers were scored dichotomously (correct or incorrect) and then summed for this 16-item instrument. Reliability and construct validity tests were run to ensure instrument quality.
3. Measure of Religiosity (Sethi and Seligman 1993). These items were previously published and validated. They were used to measure level of commitment to one's religion via personal religious practices, the influence religion has in decision making, and how religion influences one's outlook on the present and the future (i.e., hope). We used these items to address religiosity within religion as a factor in religious beliefs and acceptance of evolution. We added one item about religious commitment to the survey.

This tool was used as a 15-item scale with six response categories for all items. Responses to the fifteen items were summed to compute a measure of each participant's religiosity. We pilot tested this survey among 585 individuals recruited through social media. We preformed construct validity and reliability tests to ensure the quality of the instrument. The scale had a high level of internal consistency, as determined by a Cronbach's alpha of 0.914.

4. Measure of Creationist Views. These items measured the strength of individuals' beliefs in young earth creationism (a conservative creationist view) and were used to examine differences between religions as well as inspect the relationship between creationist views and acceptance of evolution. Creationist views included the nature of God, age of the earth, fixity of species, and the origin of humans. This is a 13-item scale, with six response categories for each item (strongly disagree to strongly agree). The items focused on how strongly individuals agreed/disagreed with statements on a general belief in God, the length of creation, the nature/origin of nonhuman species, and the nature /origin of humans. Responses were averaged with higher scores representing stronger religious beliefs. We piloted this survey among 585 individuals recruited through social media and 73 individuals recruited in introductory biology classes at Brigham Young University. Validity and reliability tests ensured the quality of the instrument as measured by confirmatory factor analyses and Cronbach's alpha (coefficient = 0.95).
5. Measure of Evolution Acceptance. We used these items as a measure of our dependent variable— acceptance of evolution. Components of evolution addressed included general definitions of evolution, age of the earth, natural selection, and the origin of humans. This is a 12-item scale, with six response categories for each item (strongly disagree to

strongly agree). Responses were averaged with higher scores representing stronger acceptance of evolution. This survey was piloted using the same group of individuals as the creationist view items. Validity and reliability tests demonstrated the instrument measured a single factor (via confirmatory factor analysis) and had a high level of internal consistency with a Cronbach's alpha score of 0.953.

Data Analyses and Instrument Validation

Structural Equation Modeling (SEM). SEM is a robust statistical analysis method used to examine the relationships between multiple variables simultaneously (Muthen and Muthen 2012). We used M-plus v.7.3 to analyze the relationships of the variables for this study. Variables analyzed in our model were religiosity (measured by religious practices, religious influence, and religious hope), creationist views, and acceptance of evolution. Religious affiliation was used as a grouping variable. First, exploratory factor analyses (EFA) were performed on each instrument in SPSS vs. 21 (IBM, [Armonk, NY]). A scree plot, eigenvalues, and % variance explained were examined to determine how many factors to retain. Confirmatory factor analyses (CFA) and model fit analyses were then performed on each instrument in M-plus in order to validate the instruments and confirm goodness of fit to the data. Items were removed or adjusted according to results in order to provide the strongest measures of each latent variable. Fit of each instrument model to the data was analyzed via fit indices, TLI, CFI, RMSEA, χ^2, and *p*-value statistics. In the CFA and measurement model for each instrument, items were classified as categorical to activate the weighted least squares estimation (WLSMV) instead of the default Maximum likelihood estimator. All instruments were then included in a full measurement model to explore

the model which best fit the data given the factors being addressed. We tested for scalar and factor invariance between religions in the measurement model using χ^2 difference testing between nested models.

Second, we developed and tested a hypothesized path diagram (structural model) for the resulting factors. The structural model was run in M-plus and we compared how it functioned between groups (religious affiliations). Finally, we tested for three kinds of invariance (structural weights, structural covariance, and structural residuals) in our model using χ^2 difference testing between nested models.

Variable Association Analysis. Using SPSS v. 21 (IBM, [Armonk, NY]), we ran a series of analyses to assess mean differences between religious affiliation and religiosity and to get a preliminary assessment of relationships between variables. First, one-way ANOVAs were run to determine if acceptance of creationist views, acceptance of evolution, and/or knowledge of evolution were different for groups with different religious affiliations. We also used one-way ANOVAs to determine if acceptance of creationist views and acceptance of evolution were different depending on levels of religious commitment. Individuals were split into levels of religiosity based on standard deviation, with average religiosity being defined as those who were within one standard deviation of the mean, high religiosity being those who were above one standard deviation, and low religiosity being those who were below one standard deviation (see Table 1). T-tests were conducted to determine if general acceptance (not taking religious affiliation into account) differed significantly between various components of evolution (general evolution, time, natural selection, and human evolution). In addition, one-way ANOVAs were

conducted to determine if acceptance of components of evolution were different based on religious affiliation.

A total of 724 responses were collected from adults nationwide, with equal numbers of Baptists, Catholics, Jews, and Mormons being surveyed (see Table 1).

Table 1. Sample Size by Religiosity

	Catholic	Jewish	LDS (Mormon)	Southern Baptist
High Religiosity (> 1 SD above mean)	30	31	23	33
Average Religiosity (Within 1 SD of mean)	122	126	129	123
Low Religiosity (> 1 SD below mean)	26	21	30	26
Total	178	178	182	182

RESULTS

Instrument Validation and Structural Modeling

Construct Validation Exploratory factor analysis rendered three factors from our religious measure with eigenvalues above 1 that also explained over 5% of the variance seen in the data. The resulting religious factors were religious practice, religious influence, and religious hope. One factor resulted for each of the remaining measures of creationist views and evolution acceptance. Each of these measures only had one factor with an eigenvalue higher than 1 that also explained more than 5% of the variance.

We used CFAs to analyze the validity of each construct as measured by individual instruments. The factor loadings for each item from all instruments were high (above 0.5) with few exceptions. The fit statistics for each CFA can be found in Table 2. Our religiosity scale factored into three variables: practice, influence, and hope. Items were removed from the religiosity and creationist views instruments (e.g., Q2.4: "How often do you pray?" Q3.2: "All creatures on earth were created in the last 10,000 years," and Q3.2: "All present day humans are direct descendants of Adam and Eve.") due to redundancy (i.e., lack of uniqueness) or poor fit. The fit statistics show that each instrument model fit the data well.

Table 2. Fit Statistics and Adjustments for Individuals Scales in SEM

				Chi-square Test			
	TLI	CFI	RMSEA	χ^2	*Degrees of Freedom*	*p*-value	Adjustments
Religiosity	.977	.970	.081	1057.23	481	< .001	One item (Q6) removed. Three factors.
Creationist Views	.992	.981	.103	249.56	86	< .001	Two items (Q10 & Q12) removed
Evolution Acceptance	.989	.957	.122	361.919	98	< .001	None
Complete Measurement Model	.972	.956	.111	953.410	295	< .001	Thresholds were estimated freely except for P4.

Measurement Model. The complete measurement model can be seen in Figure 1. The measurement model shows correlations between factors and the loadings of each item on their respective factor. When testing for invariance in the model, we found scalar invariance and partial metric invariance. An adjusted metric model was accepted. The only adjustment to the model was not allowing the thresholds of one religious practice item (P4) to be freely estimated;

attempting to freely estimate the thresholds of P4 caused the analysis to terminate early due to convergence problems. The overall fit of the measurement model was good (see Table 2).

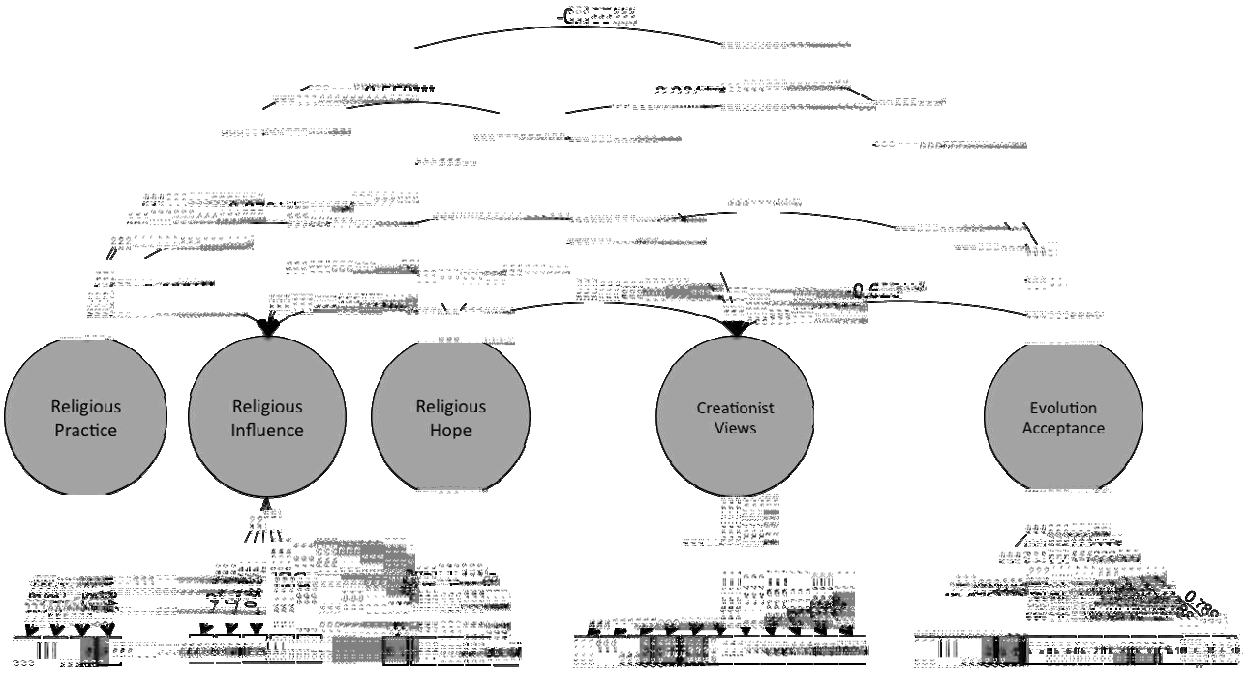


Figure 1. Complete Measurement Model*: Unidirectional arrows show factor loadings for each item and correlational relationships are show by bidirectional arrows; both are labeled with standardized coefficients. Significant relationships are marked (*** $p < .001$; ** $p < .01$; * $p < .05$).*

Structural Modeling. To analyze the relationships between latent variables, we tested our hypothesized model (see Figure 2). The model is a good fit for the data as indicated by fit statistics and *p*-values (TLI = 0.941; CFI = 0.976; RMSEA = 0.104; $\chi^2 = 825.001$, $p < 0.001$). The vast majority of parameter estimates are statistically significant as well. When testing for structural invariance, the best-fitting model allowed religious hope to differ for Jews and religious practice to differ for Baptists. The final model shows that religiosity is a significant predictor of creationist views, and religiosity and creationist views are significant predictors of acceptance of evolution. These results of the SEM are discussed in further detail below.

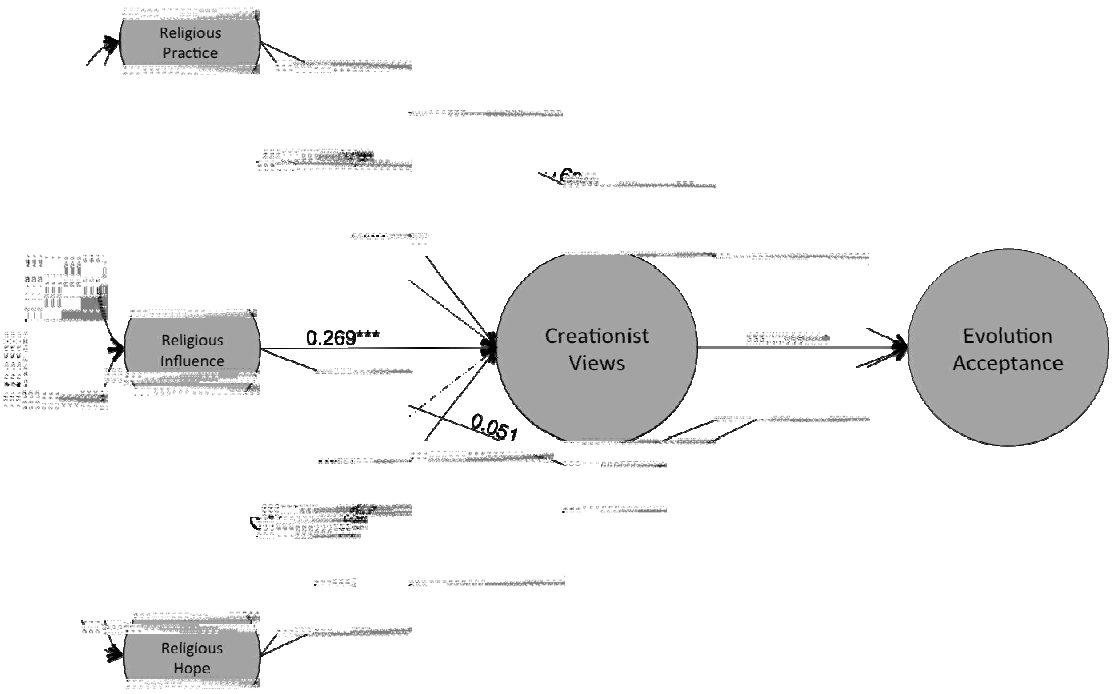


Figure 2. Structural Model*: Unidirectional arrows show predictive relationships and correlational relationships are show by bidirectional arrows; both are labeled with standardized coefficients. The structural model is the same for all religions, with exceptions displayed with lighter arrows. Significant relationships are marked (*** $p < .001$; ** $p < .01$; * $p < .05$).*

Structural Relationships and Variable Associations by Research Hypothesis

1. Correlation of creationist views with evolution acceptance. From the structural equation model, overall acceptance of creationist views is a predictor of overall acceptance of evolution ($p < 0.001$; see Figure 2). In other words, the more likely a person is to agree with creationist views, the less likely they are to accept evolution. when we measured the number of constructs of the knowledge of evolution instrument, EFA and CFA showed that there were no unifying constructs that this instrument measured, therefore the instrument was not useful for structural equation modeling and was left out. According to our one-way ANOVA, there was a significant difference in knowledge between religious groups ($p > 0.001$). The LDS group ranked highest in

their knowledge of evolution followed by the Jews, then the Baptists, and lastly the Catholics (see Table 3).

Table 3. Average Scores of Knowledge of Evolution by Religion

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	Significantly Differs from…
Southern Baptist (B)	182	7.05	2.84	.21	6.63 – 7.47	L
Catholic (C)	182	6.85	2.82	.21	6.43 – 7.26	J, L
Jewish (J)	178	7.83	2.84	.21	7.41 – 8.25	C
LDS (L)	182	8.21	2.63	.19	7.28 – 7.69	B, C

2. How strictness of creationist views, knowledge of evolution, and acceptance of evolution vary among individuals based on their specific religious affiliation. One-way ANOVAs were used to determine if acceptance of creationist views and/or evolution were different depending on religious affiliation. Acceptance of creationist views was significantly different between religious groups ($p < 0.0001$, see Figure 3), being highest among the Baptists and LDS (not significantly different from each other) and lowest among the Catholics and Jews individuals. Not surprisingly, the opposite was shown for acceptance of evolution between religions (p-value < 0.001, see Figure 3). Baptists and LDS were the least accepting of evolution (not significantly different from each other) while Catholics and Jews individuals were the most accepting.

Grouping individuals by general acceptance (>50% acceptance on scale) or general rejection (<%50 acceptance on scale) of creationist views, it is clear that the Baptist and LDS populations are generally more accepting of strict creationist views while Jews are generally more rejecting of strict creationist views (see Table 4). From a similar grouping for acceptance of evolution, our

data show that Catholic and Jewish populations are generally more accepting of evolution while Southern Baptist and LDS are generally more rejecting of evolution (see Table 5).

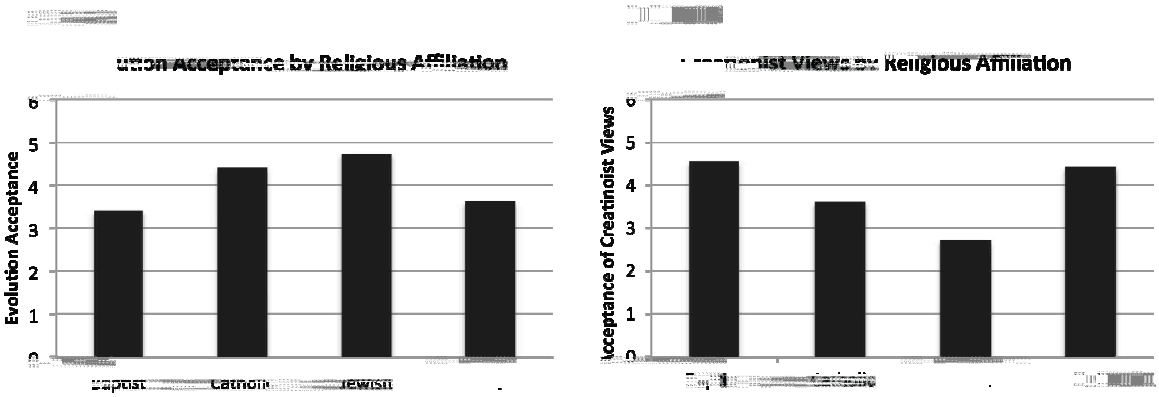


Figure 3. (a) Average Acceptance of Evolution by Religious Affiliation (b) Average Acceptance of Creationist Views by Religious Affiliation

Table 4. Cross Tabulation of Acceptance of Creationist Views by Religion

		Religion				Total
		B	*C*	*J*	*L*	
Overall Rejecting	*Count*	38	103	135	54	33.0%
	% within religion	20.9%	56.6%	75.8%	29.7%	45.6%
Overall Accepting	*Count*	144	79	43	128	39.4%
	% within religion	79.1%	43.4%	24.2%	70.3%	54.4%

Table 5. Cross Tabulation of Evolution Acceptance by Religion

		Religion				Total
		B	*C*	*J*	*L*	
Overall Rejecting	*Count*	125	55	34	119	333
	% within religion	68.7%	30.2%	19.1%	65.4%	46%
Overall Accepting	*Count*	57	127	144	63	391
	% within religion	31.3%	69.8%	80.9%	34.6%	54%

3. Function of religiosity within each religion in affecting views on creationist views and acceptance of evolution. From our structural equation model, the general trend among all religions was that acceptance of evolution is directly and indirectly (through creationist views) affected by all three constructs of religiosity (see Figure 2).

In general, the LDS were the most "religious" (scored highest in all three constructs), followed by the Southern Baptists, then the Catholics, and ending with the Jews ranking as the least religious (scored lowest in all three constructs). The general trend among all the religions investigated herein was that acceptance of evolution was significantly different between levels of religiosity, F (1, 721) = 30.221, p-value <0.001. Acceptance of statements on evolution was highest among individuals of low religiosity (4.60 ± 1.35), followed by individuals of average religiosity (4.09 ± 1.16), then individuals of high religiosity (3.39 ± 1.35). Games-Howell post hoc analysis revealed that all comparisons between all levels of religiosity on acceptance of evolution were significant ($p < 0.001$). How religiosity affects creationist views and acceptance of evolution within each religion can be seen in Table 6 and Figures 4a and 4b.

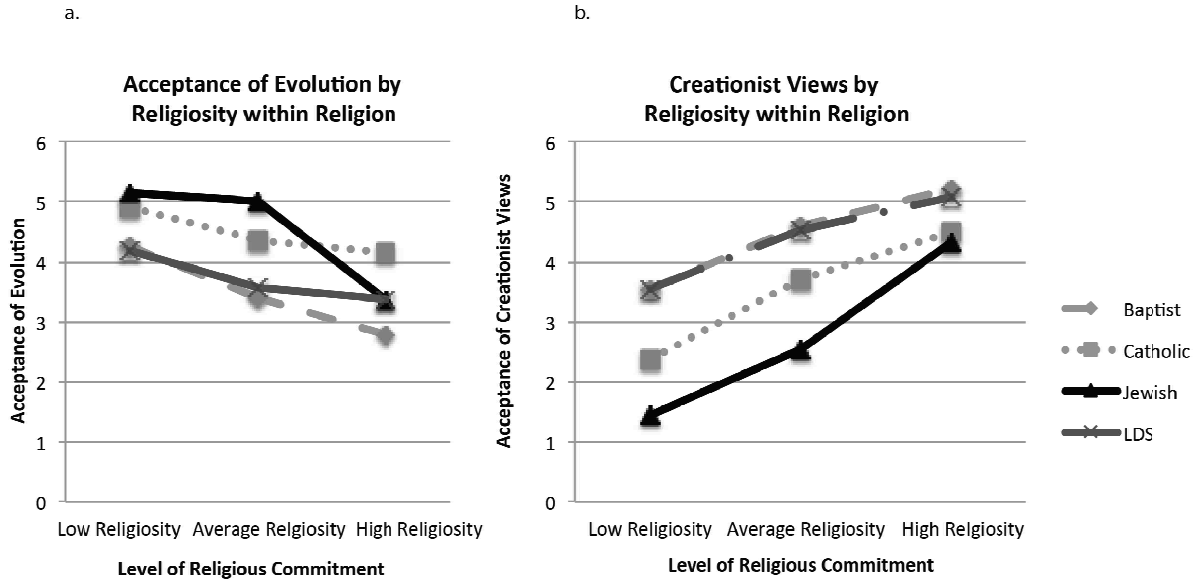
We tested if there was an interaction between acceptance of evolution/creationist views and level of religious commitment (i.e. if the level of religious commitment functions differently in influencing acceptance of evolution/creationist views depending on religious affiliation). According to our One-way ANOVA, the interaction between religion and religiosity on acceptance of evolution was significant ($F(6,724) = 6.037$, $p < 0.001$), meaning that religiosity affects evolution acceptance differently based on religious affiliation. One difference between religions is that for Jews, being of average religiosity is the same as having low religiosity when

it comes to accepting evolution. Whereas, among other religions, those of average religiosity were more likely to group with highly religious people in their acceptance (or lack thereof) of evolution (see Table 6).

Table 6. Effect of Religiosity within Religion on Evolution Acceptance.

	F- statistic (degrees of freedom)	High Religiosity (95% CI)	Average Religiosity (95% CI)	Low Religiosity (95% CI)	Pair wise Comparisons
Southern Baptist	12.77*** (1,179)	2.78 (2.32,3.23)	3.41 (3.22,3.60)	4.25 (3.81,4.70)	H v. A: $p = .012$ H v. L: $p < .001$ A v. L: $p = .002$
Catholic	4.761** (1,179)	4.14 (3.64,4.64)	4.35 (4.17,4.53)	4.92 (4.62,5.23)	H v. A: NS H v. L: $p = .006$ A v. L: $p = .025$
Jewish	41.081*** (1,175)	3.35 (2.87, 3.84)	5.02 (4.88,5.16)	5.16 (4.67,5.65)	H v. A: $p < .001$ H v. L: $p < .001$ A v. L: NS
LDS	5.591** (1,179)	3.38 (2.92,3.83)	3.56 (3.40,3.73)	4.18 (3.89,4.48)	H v. A: NS H v. L: $p = .006$ A v. L: $p = .004$

*** $p < .001$
** $p < .01$



Figures 4. (a) Acceptance of Evolution by Religiosity within Religion (b) Creationist Views by Religiosity within Religion

4. Affect of religious affiliation on how individuals view specific components of evolution (e.g., general evolution, age of the earth, natural selection, and/or human evolution). T-tests were conducted to determine if general acceptance (regardless of religion) between various components of evolution was significantly different. In addition, one-way ANOVAs were conducted to determine if acceptance of components of evolution were different for groups with different religious affiliations. Data was approximately normally distributed for each group, as assessed by visual inspection of Normal Q-Q Plots**.** Between the components of evolution, people regardless of affiliation are significantly more accepting of an old earth (time), yet widely differ in acceptance of human evolution than the remaining components we tested (see Figure 5).

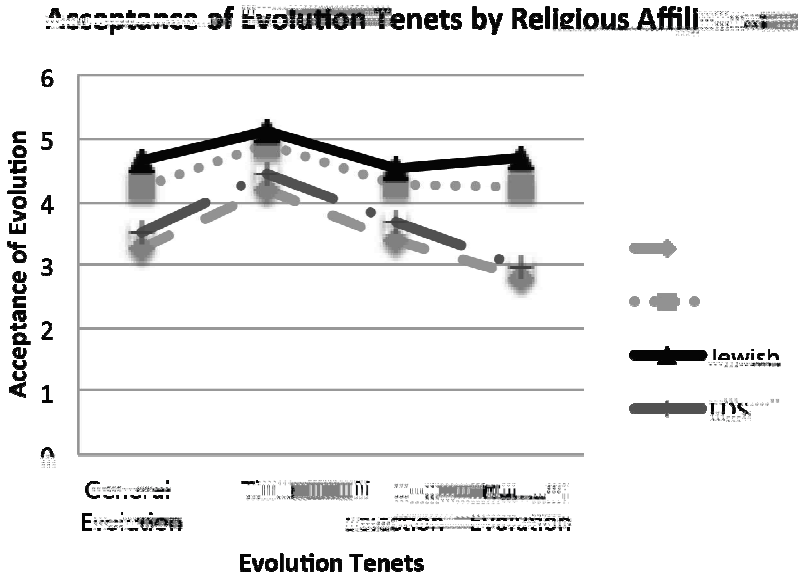


Figure 5. Acceptance of Evolution Tenets by Religious Affiliation

Acceptance of all components of evolution was significantly different between the four religious groups in this study (see Table 7). Catholic and Jewish had higher acceptance of all four components of evolution than Baptist and LDS individuals. Games-Howell post hoc analysis revealed that most comparisons between religions on acceptance of specific components were

significant (see Table 6). How religious affiliation affects acceptance of specific evolutionary components can be seen in Table 6 and Figure 5.

Table 7. Acceptance of Components of Evolution by Religious Affiliation

	F-statistic (degrees of freedom)	Southern Baptist (B)	Catholic (C)	Jewish (J)	LDS (L)	Games-Howell Post-hoc Analyses
General Evolution Mean (95% CI)	54.696*** (3,720)	3.25 (3.06, 3.44)	4.23 (4.06, 4.40)	4.67 (4.50, 4.85)	3.50 (3.35, 3.66)	B v C: p <.001 B v. J: p <.001 B v. L: NS C v. J: p <.001 C v. L: p <.001 J v. L: p <.001
Time (95% CI)	24.449***	4.21 (4.02, 4.40)	4.90 (4.76, 5.04)	5.11 (4.95, 5.29)	4.45 (4.30, 4.60)	B v C: p <.001 B v. J: p <.001 B v. L: NS C v. J: p <.001 C v. L: p <.001 J v. L: p <.001
Natural Selection (95% CI)	35.386***	3.39 (3.20, 3.58)	4.29 (4.12, 4.46)	4.51 (4.34, 4.69)	3.67 (3.51, 3.83)	B v C: p <.001 B v. J: p <.001 B v. L: NS C v. J: NS C v. L: p <.001 J v. L: p <.001
Human Evolution (95% CI)	79.190***	2.82 (2.59, 3.04)	4.23 (4.03, 4.43)	4.68 (4.48, 4.88)	2.95 (2.75, 3.15)	B v C: p <.01 B v. J: p <.01 B v. L: NS C v. J: p <.01 C v. L: p <.01 J v. L: p <.01

*** p < .001

DISCUSSION

As predicted, the stronger the creationist views an individual holds, the less likely that individual is to accept evolution. These findings are novel since a link between a group of creationist views

and acceptance of evolution has not been studied in detail. An analysis of the results demonstrates that those that harbor more creationist views inherently opposed evolution. It has been found that creationist views were correlated with lack of knowledge and understanding of evolution (Lawson and Worsnop 1992; Moore et al. 2009). Knowledge has been related to acceptance of evolution in numerous studies (Akyol et al. 2010; Kim & Nehm, 2011; Ha, Haury, & Nehm, 2012) and it is reasonable that creationist views, which affect knowledge of evolution, are negative predictors of evolution acceptance.

Most religious individuals in the US take on a more figurative interpretation of the creation of the earth (Jones 2011). Still, there is a reservations about accepting evolution (REF). Students may view evolution and religion as conflicting because teachers are often hesitant to teach evolution resulting in misconceptions (BouJaoude et al. 2011; Goldston & Kyzer 2009; Rutledge & Mitchell 2002). Rutledge & Mitchell (2002) found that one-third of high school biology teachers spend less than three days teaching evolution. The dilution or even omission of evolution in the K-12 classroom stems from teacher perceptions of evolution (BouJaoude et al. 2011; Nadelson & Nadelson 2010; Schrein et al. 2009). As a result, students are given little to no time or content to allow them to reconcile their religious beliefs with the theory of evolution.

Though the misconceptions about evolution are present throughout the U.S., we analyzed whether the number of misconceptions (i.e., lack of knowledge) varied by religious affiliation. From our data, we did find significant differences in knowledge of evolution between religions. What we predicted was that acceptance of evolution among a religion would be associated with knowledge on the topic. However, we found the LDS and Jewish populations to be most

knowledgeable of evolution but to vary widely in their acceptance of evolution (Jews being far more accepting). On the other end, we found that the Baptist and Catholic individuals we surveyed were the least knowledgeable about evolution; yet Catholics were far more accepting of evolution than the average Christians in general and Baptists were both less knowledgably and less accepting. While knowledge of evolution differs between religious affiliations, it does not appear to be an indicator of how accepting a population is of evolution. Interestingly, we did find that affiliation did have an influence on acceptance of evolution (see below) but we found no link between knowledge and acceptance of evolution. We were surprised by this result since it contradicts our predictions based on previous studies cited above (Akyol et al., 2010; Kim & Nehm, 2011; Ha, Haury, & Nehm, 2012). However, further exploration into the literature reveals that the relationship between knowledge and acceptance of evolution has been inconclusive (Rissler et al. 2014; Glaze and Goldston 2015). Although, our data shows that knowledge about evolution did not predict acceptance of evolution, we are not claiming that there is no relationship between them.

Just as knowledge of evolution differs significantly from one religion to another, so do creationist views. Results from a one-way ANOVA found significant differences between religions in their acceptance of creationist views. From this analysis, individuals from the LDS and Baptist religions held the most strict creationist views; Catholics tended to hold a moderate view of the creation; and those of the Jewish faith held more figurative views of the creation story.

In comparing the religions to one another, the Southern Baptists and LDS possessed the strongest creationist views. This is not surprising among Southern Baptist parishioners, as many statements have been made by many Baptist church leaders in support of a young earth and literal translation of the Bible (i.e., more extreme creationist views). On the continuum of creationism (Scott 1997), the membership of the Southern Baptist churches would be classified in the category of young earth creationists. In 1982, the Southern Baptist Convention declared, "Whereas, creation-science can be presented solely in terms of scientific evidence without any religious doctrine or concepts…[we] express our support for the teaching of Scientific Creationism in our public schools." Similar to the Southern Baptists, The LDS church is also known for its creationist views ("Creation" 2014). However, the LDS religion is also open to a figurative interpretation of the Bible and has not taken a stance on the movement to have creationism taught in schools. The LDS church proclaims that God created the earth, but they do not support one method or theory for how it was done (Ludlow 1992) leaving the LDS Church in a neutral position on the theory of evolution. While the Southern Baptist and LDS religions differ on a large amount of their doctrines, members of both religions seem to demonstrate greater religious commitment to their respective doctrines in the way they worship and the choices they make (as reflected by religiosity scores). Thus religious commitment, not beliefs about doctrine, may be the greater motive for accepting stronger creationist views.

Though creationist views significantly differ from one religion to another, evolution is an overarching conflict that is prevalent across Christian denominations (Murphy et al. 2010). Taking this into consideration, our analysis of views toward evolution disaggregated by three mainstream Christian denominations plus the Jewish faith found significant differences between

religious affiliations in terms of their acceptance of evolution. Individuals from the LDS and Baptist faiths were the least accepting of evolution while Catholics form the middle group between the LDS/Baptist group and the Jewish group, who are the most accepting of evolution. This is corroborated by our breakdown of individuals within each religion whose scores reflected overall acceptance (>50%) or overall rejection (<%50) of evolution. Catholic and Jewish populations are generally more accepting of evolution while Southern Baptist and LDS are generally less accepting of evolution (see Table 5). This is the opposite trend to that seen for acceptance of creationist views.

Previous research shows that many clergymen (Christian and Jewish) find that science and religion are compatible, if not complimentary (Colburn and Henriques 2006; Zimmerman 2010). Interestingly, even though religious leaders see no conflict between their faith and evolution, the vast majority of Christians still reject the theory.

The Jews, which have low acceptance of creationist views and high acceptance of evolution, is an interesting case. When looking at the reason Jews are more accepting of evolution over others, we take into consideration their education and views on science. When looking at the proportion of the general public to scientists that affiliate with a specific religion, Jewish individuals have the highest numbers: only 2% of the general public affiliates with Judaism, 8% of scientists are Jewish (Masci 2009). Jews are also the most highly educated of religious traditions next to Hindus (Pew Research Center 2015). It may be due to these factors that Jewish individuals are the most flexible with their creationist views (see above) and the most accepting of biological evolution (corroborated by Miller 2008). Interesting to note is that while Jews and Christians

have some fundamental differences in belief, they also have much in common, namely the belief in the Old Testament, which contains the doctrine of the creation of the earth. The reason that Jews are more comfortable embracing evolution in spite (or because of) their beliefs while Christians continue to battle this biological theory is a mystery that may be useful to explore. The key to the Jewish population's overall acceptance of evolution may open doors to how to educate Christian students about evolution.

Of the Christian religions, we found Catholics to be the most accepting of evolution, which corroborates previous work (Miller 2008). Pope Pius XII was the first Catholic Pope to openly consider evolution as a means for creation (1950) and more Popes have made similar statements since (Mislin 2012). Most recently, Pope Francis stated, "evolution…is not opposed to the notion of creation" (McKenna 2014). Therefore, it may be due to the ecclesiastical leadership of the Catholic Church that its membership is overall more accepting of evolution than other Christian religions. However, 42% of Catholics still reject evolution (Lugo et al. 2008), showing that there is room for education and improvement among even the most accepting of Christian religions.

One factor that needs to be addressed when looking at the lack of evolution acceptance among Christian religions in the U.S. is religiosity within a religion. The general trend, per SEM results, suggests that there is a statistically significant relationship between religiosity and acceptance of strict creationist views (see Figure 2). In other words, the more religious an individual is, the more likely they will accept these strict creationist views. While this is the overall trend, it is likely that many individuals who are highly religious do not hold strict creationist views.

While religiosity and creationist views are generally positively/directly related (i.e., as one increases the other increases), it is interesting to note the negative relationship between religious practice and creationist views for all religions except Southern Baptists. As a reminder, we are referring to creationist views to be those supported by creationist movements (e.g., 6,000 year old earth and creation lasting a literal six days). This infers that for Catholics, LDS, and Jews, the more one reads scriptures and attends church services, activities, and seminars the less strict their creationist views are. This phenomenon can be substantiated by the finding of Manwaring et al (*submitted*). In this study, they conclude that one variable among LDS students which inhibits acceptance of evolution is lack of understanding of their own religion (Manwaring et al 2015). While one professes membership to a religion it does not mean they know or understand all its core beliefs. There may be significant differences between what one perceives is the belief of their church and what actually is the belief of their church. Thus, misunderstanding the beliefs/stance of one's church on evolution can lead to acceptance of creationist views that are not necessarily part of the individual's affiliation.

As one would expect, the relationship between religiosity and evolution acceptance shows opposite trends to the relationship between religiosity and creationist views. The indirect effect of religiosity (through acceptance of creationist views) on acceptance of evolution shows that religiosity and evolution acceptance are negatively related. This same trend holds true when examining the direct relationship between religious practice and acceptance of evolution. The more an individual observes religious practices, the less likely they will be to accept evolution. However, when looking at the direct effect of religious hope on evolution acceptance, it appears that more "hope" correlates with more acceptance of evolution (see Figure 2).

In regards to how religiosity within religions affects the acceptance of evolution (see Figure 4a), we found differing patterns between religions. The Southern Baptists follow a predictable trend with a significant difference in acceptance of evolution between each level of religiosity: the more religious, the less accepting of evolution. Catholics and LDS followed similar patterns but with a slight dichotomy: people of high and average religiosity grouped together as less accepting of evolution and people of low religiosity were significantly more accepting of evolution (see Table 6 and Figure 4a). Within the Jews we found a more pronounced dichotomy with the opposite trend, either a person has average or low religiosity and accepts evolution or is highly religious and does not accept evolution (see Table 6 and Figure 4a). For the Catholics and LDS it seems to be that low religiosity has the greatest effect on views while within the Jews it is high religiosity that has the larger effect.

When looking at how religious affiliation affected attitude toward specific components of the theory of evolution, we found interesting trends that should inform where we focus our time in the classroom. Within creationist movements, one of the biggest fought battles regarding evolution has been the age of the earth (Reed 1998; Reed and Williams 2011; Doyle 2012). The whole foundation of young earth creationism is that the Bible, and evidence supporting it, can be used to date the earth and gives very specific details about its creation in six days (Walker 2000; Sanford et al. 2007; Humphreys 2012). However, this does not seem to be a conflict for most religious individuals (including Baptists who lean to stricter creationist views). From our data, we found that every religion had at least a 60% acceptance rate of an old earth, much more than of any other component of evolution. This suggests that the idea of the earth being old earth is

becoming more mainstream and thus less classroom time is needed to discuss/teach this component of evolution.

While age of the earth appears to be a non-issue for most students, it is not surprising that the many students (mostly Southern Baptist and LDS) struggle to accept human evolution. It is common for religious people to accept evolution, except for when it concerns human origins (Pew Research Center 2013). What is interesting is that Catholics and Jews surveyed in our study are just as accepting, if not more, of human evolution as of other components. Aside from age of the earth and human evolution, the other two components of evolution measured in this survey were attitudes toward evolution in general and natural selection/speciation. Jews and Catholics were overall accepting (i.e., had over a 50% acceptance rate) of both of these while Baptist and LDS were overall rejecting (i.e., had under 50% acceptance rate; see Figure 5). Once again, this fits the general trend seen in the rest of the results.

Conclusion

Overall, religious affiliation does affect views and acceptance of evolution. However, for each religion the trend is the same: the higher the religiosity, the less likely they will accept the theory of evolution (more specifically general evolution, natural selection, and human evolution). To overcome this, we advise that educators take into consideration the religious demographics of their classroom. We suggest that it is best to teach evolution in a straightforward manner without attenuating any aspect of it. However, for many religious individuals, evolution is just another idea that conflicts with their beliefs. Because of this, we want to encourage educators to be aware of how religious affiliation can affect views toward evolution. Educators should also be aware of

which components of the theory students have the most trouble with. This awareness of student demographics, attitudes, and knowledge will allow educators to approach these subjects with sensitivity while spending adequate amounts of time on the areas where students need the most instruction. It is our opinion that when this happens, acceptance of evolution will increase. Further research is needed in applied evolution education to know what pedagogical methods are best.

LIST OF ABBREVIATIONS

LDS: Latter-day Saint or Mormon

ID: Intelligent Design

SEM: Structural Equation Modeling

EFA: Exploratory Factor Analysis

CFA: Confirmatory Factor Analysis

TLI: Tucker-Lewis Index

CFI: Comparative Fit Index

RMSEA: Root Mean Square Error of Approximation

WLSMV: Weighted Least Squares Estimation

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CHAPTER 3

Scientific reasoning ability does not predict scientific views on evolution

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KEYWORDS: evolution, scientific reasoning, religiosity, creationism

ABSTRACT

One of the most controversial topics in science is evolution, with a large portion of the United States still struggling to accept this unifying theory of biology. One factor that is often, if not always, associated with low acceptance of evolution is religiosity. One hypothesis that has been proposed of why religiosity negatively affects evolution acceptance is that those who are more religious have lower scientific reasoning ability, suggesting that those who have a stronger belief in God are not capable of considering alternative explanations to the creation of the earth beyond God creating it *ex nihilo*. Our research addresses the effect of religiosity, creationist views, and scientific reasoning ability on evolution acceptance. We surveyed religious adults nationwide on their religiosity, attitudes to creation and evolution, and ability to reason scientifically. Data

analyses were completed using structural equation modeling. Our results show that while religiosity and attitudes to creation/evolution significantly affect acceptance of evolution, scientific reasoning ability has no relationship with evolution acceptance or religiosity. These results indicate that scientific reasoning ability is unrelated to religiosity and has no effect in religious persons' rejection of evolution.

INTRODUCTION

Religious views can be a major obstacle among students in the US and often prevent students from accepting evolution as a viable theory (Anderson 2007; Andersson & Wallin, 2006). Religious commitment, or religiosity, is frequently a factor in predicting whether or not an individual will accept the theory of evolution. Studies show that more religious students are less likely to both understand and accept evolution (Barnes et al., 2008; Moore et al., 2011). Lawson and Worsnop (1992) hypothesize that high religiosity is correlated with low scientific reasoning skills and that these reduced reasoning skills lead to reduced acceptance of evolution (Lawson and Worsnop 1992). This provocative hypothesis spurred the current study, the goal of which was to test the significance of the relationships between religiosity, scientific reasoning ability, creationist beliefs and evolution acceptance. In addition, we were able to parse out the individual factors of religiosity and their influences on acceptance of evolution.

Creationism

The creationist movement began in the 1920s. The most fundamental form of creationism accepts a literal interpretation of the Bible, a young earth (i.e., 6,000 years old), and an *ex nihilo* creation by a divine being. Intelligent Design (ID) has emerged as a more recent form of creationism with the goal to disprove evolution, provide evidence for an "intelligent creator" and have creationism taught in schools (Behe 1998, Behe 2000). ID frames the debate in scientific terms while removing scriptural references. ID arguments break down when tested with empirical data and using the scientific method as well as an evolutionary perspective (Sanz 2009; Boudry and Leuridan 2011). The degree to which religious people embrace creationism is extremely variable, ranging from beliefs in a young earth and special creation to a belief in

theistic evolution (i.e., trusting God is the creator while accepting all evidences and theories of the scientific community; Scott 1997). Where an individual falls on the spectrum of creationism usually defines where they fall on the spectrum of evolution acceptance (Scott 1997). While religious beliefs may encumber evolution acceptance, evidence suggests religion and evolution do not have to be mutually exclusive (Miller 2002; Longest and Smith 2011).

Religiosity

Religiosity is the level of commitment to religious practices and principles centered on a belief in God . The US has the lowest acceptance of evolution in the world (Miller 2006) and is likely due to a highly religious population (Coyne 2012, Drees 2012). Heddy and Nadelson (2013) found a significant negative correlation between evolution acceptance and religiosity when analyzing religiosity, evolution acceptance educational achievement data for each US state. The same trend is found among both small and large study populations (Heddy & Nadelson, 2012; Alters and Alters 2001;Miller 2008; Nadelson and Sinatra 2009; Scott 2005, Heddy and Nadelson 2013, Rissler 2014).

A broad limitation of the current literature is the lack of consistency in measuring religiosity (e.g., Lawson and Worsnop 1992, Village and Baker 2013, Rissler et al. 2014). Religiosity can be complex and encompass many aspects of practice, lifestyle and outlook. Yet, studies range from measuring religiosity with a single item/question (Heddy and Nadelson 2013) to more complex, multi-question instruments (Sethi and Seligman 1993). Religiosity is more effectively measured by a suite of variables (Gardner et al. 1998) to provide a stronger more accurate measure of religiosity.

Scientific Reasoning Ability

Despite the abundance of literature on scientific reasoning ability (e.g., Bao et al., 2009; Carmel & Uezierski, 2012; Gormally et al., 2012; Jensen et al., 2014; Lawson et al., 2007; She & Liao, 2010; Zimmerman, 2000) a relationship between scientific reasoning ability and evolution learning remains unclear (e.g., Nehm & Schonfeld, 2007; Deniz et al., 2008; Hokayem & BouJaoude 2008). A well-used tool for measuring scientific reasoning is Lawson's Classroom Test of Scientific Reasoning (LCTSR; Lawson 1978, ver. 2000). This tool has been used in a variety of studies including testing Piaget's cognitive development theory (Lin 1980, Niaz 1991), comparing scientific reasoning to knowledge acquisition (Lawson and Thompson 1988, Gerber et al. 1996), for diagnostic testing of various ages or educational groups (Lawson and Worsnop 1992, Lawson et al. 2007), and to research gender differences (Shemesh 1990, Germann 1994).

The relationship between scientific reasoning ability and evolution acceptance has only been explicitly studied in a handful of cases (e.g., Lawson & Weser, 1990; Lawson & Worsnop, 1992). In these cases, researchers measured the relationships between LCTSR scores and non-scientific views, religiosity, and knowledge of evolution. The main hypothesis was that higher scientific reasoning led to rejection of non-scientific views and thus acceptance of evolution. In order to test this, scientific views, religious views, and scientific reasoning ability (Lawson & Weser, 1990) as well as initial belief in special creation, and knowledge of evolution (Lawson & Worsnop, 1992) were measured. Three main trends emerged from this research: (1) religious commitment contributes positively to a belief in special creation and negatively to acceptance of evolution, (2) students with higher reasoning ability were less likely to believe in non-scientific

beliefs, and (3) higher reasoning ability had an effect on gains in knowledge about science. Although it was implied that scientific reasoning and religious commitment (or religious beliefs) are inversely related in a path analysis, the relationship was not significant.

Research Questions

We aim to clearly establish the nature of the relationship between scientific reasoning ability, creationist beliefs, religiosity, and acceptance of evolution. To evaluate this relationship, we addressed the following questions: (1) Is scientific reasoning ability a significant predictor of religiosity and of creationist views? (2) Is scientific reasoning ability a significant predictor of evolution acceptance? (3) To what degree does religiosity drive creationist views that then predict acceptance of evolution?

METHODS

Approval from the BYU IRB was obtained for this research prior to data collection (IRB E14297).

Study Population

In order to study the relationships between religiosity, creationist views, acceptance of evolution, and scientific reasoning, we surveyed 724 religious individuals nationwide. Individuals were chosen on the basis of membership to one of four major religions in the US: Catholic, Jewish, The Church of Jesus Christ of Latter-day Saints (i.e., Mormons), or Southern Baptist. Non-religious individuals were not surveyed but the level of religiosity among those surveyed varied

widely. We mainly targeted college-age students to participate in the study--over half (57%) of the individuals were between 18 and 25 years old.

Instruments

The instrument administered was divided into five parts (see Appendices D and F*)*:

1. Measure of Religiosity (Sethi and Seligman 1993). We used Sethi and Seligman's (1993) pre-validated and published religiosity instrument designed to measure religiosity, with the addition of one item regarding religious commitment. The 17-item instrument measures religiosity from three areas: religious practices (e.g. church attendance and frequency of prayer), influence of religion on daily decisions (e.g. food choices), and outlook on life/future (i.e., religious hope). All items have six response categories on a Likert response scale (i.e., strongly disagree to strongly agree). The instrument had a high level of internal consistency (Cronbach's alpha = .91). Item responses were summed to produce a total religiosity score.
2. Measure of Creationist Views. This instrument was designed to assess the measure of strictness a respondent holds to views on the creation. Creationist views addressed in this instrument included the nature of God, age of the earth, fixity of species, and the origin of humans. This instrument is comprised of 13-items, with six response categories on a Likert response scale (strongly disagree to strongly agree). Responses were averaged with higher scores representing stronger religious creationist views. As a pilot, this survey was administered to 585 individuals recruited through social media and 73 individuals recruited at Brigham Young University. Validity and reliability tests demonstrated that

the instrument measured a single factor (via confirmatory factor analysis) and had a high level of internal consistency (Cronbach's alpha score = .96).

3. Measure of Attitude of Evolution. We used these items as a measure of our dependent variable—acceptance of evolution. Aspects of evolution included in this instrument addressed general principles of evolution, age of the earth, natural selection, and human origins. The instrument consisted of 12-items, again with six response categories on a Likert response scale (strongly disagree to strongly agree). Responses were averaged with higher scores representing stronger acceptance of evolution. This survey was piloted among the same group of individuals as the creationist views instrument. Validity and reliability (confirmatory factor analysis) tests verified the instrument measured a single factor and had a high level of internal consistency (Cronbach's alpha score = .95).

4. Lawson's Classroom Test of Scientific Reasoning (LCTSR; Lawson 1978, ver. 2000). This is a measure of overall scientific reasoning ability (including proportional reasoning, identifying and controlling variables, probabilistic reasoning, and correlational reasoning; Lawson 1982). This instrument consists of 12-paired questions (24 items total) with multiple-choice categories. A 24-point scoring scheme was used.. Due to the length of the combined survey (66 total items), the LCTSR was administered at the beginning of the survey for one group (124 respondents) and at the end of the survey for another group (600 respondents) to test for survey fatigue. There was no statistically significant difference in LCTSR score between the two groups indicating no effects of fatigue.

Analyses

Instrument Validity. We used exploratory and confirmatory factor analysis (EFA and CFA, respectively) to validate the instruments in this study. The analysis was completed using Mplus software ver. 7.3. Variables analyzed in our model were religiosity (measured by religious practices, religious influence, and religious hope), creationist views, scientific reasoning, and acceptance of evolution. First, EFA was performed on each instrument, using SPSS software ver. 21, followed by CFA, using Mplus. Geomin rotation was used in the EFA and a scree plot, eigenvalues, and % variance explained were employed to determine how many factors to retain. Items were removed or adjusted according to results in order to provide the strongest measures of each latent variable. In the CFA, fit of each instrument model to the data was analyzed via fit indices, TLI, CFI, RMSEA, $\chi 2$, and p-value statistics. In the CFA and measurement model for each instrument, variables were classified as categorical to activate a weight least squares estimator (WLSMV). All instruments were combined into a full measurement model to ensure fit of model to the data prior to structural modeling.

Exploratory Factor Analysis. Exploratory factor analysis rendered three factors from our religious measure (with eigenvalues above 1 and explaining over 5% of the variance seen in the data): religious practice, religious influence, and religious hope. For each of the remaining instruments (Creationist Views, Evolution Acceptance, and Scientific Reasoning), only one factor had an eigenvalue higher than 1 that also explained more than 5% of the variance.

Confirmatory Factor Analysis and Complete Measurment Model. To analyze the validity of each construct as measured by individual instruments, we used CFAs. Three items were removed due

to lack of it or redundancy: one item regarding frequency of prayer was removed from the religious practice factor due to poor fit and two items were removed from the creationist views factor due lack of uniqueness. Fit statistics show that each instrument model fit the data (see Table 1). Figure 1 displays the measurement model with correlation coefficients between each factor and factor loadings between items and each factor. Factor loadings were high (above 0.5) with few exceptions. One cross loading was added between items 5 and 6 for creationist views. Fit statistics for the overall measurement model are shown in Table 1 and show a good fit of the data. The religiosity measure was adjusted to allow thresholds to differ for one item only (see output in Appendix G).

Table 1. Fit statistics for each instrument and measurement model

				Chi-square Test		
Latent Variable (Construct)	TLI	CFI	RMSEA	χ^2	DF	*p*-value
Religiosity	.977	.970	.081	1057.233	481	< .001
Scientific Reasoning	.952	.939	.055	237.278	154	< .001
Creationist Views	.992	.981	.103	249.560	86	< .001
Acceptance of Evolution	.989	.957	.122	361.919	98	< .001
Complete Measurement Model	.981	.982	.040	2284.178	1064	< .001

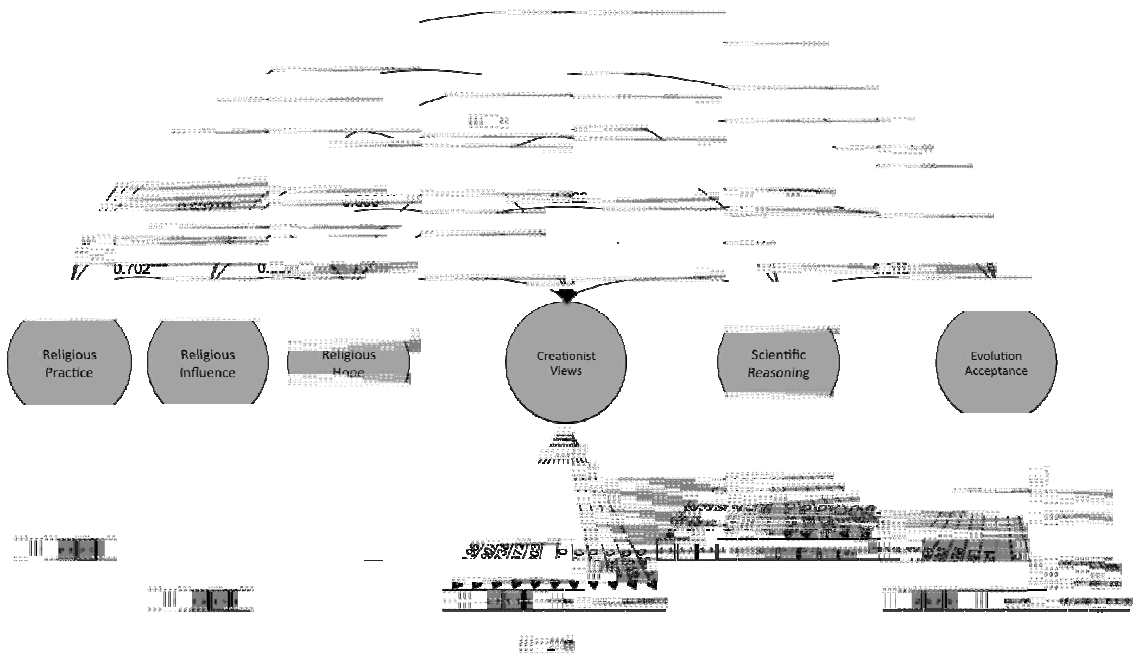

Figure 1. Complete Measurement Model*: Culminating measurement model from our SEM calculation Bidirectional arrows display correlations while directional arrows display factor loading for each item on their respective factor. Significance is noted for the correlations: ***p < .001. All factor loadings were significant at p < .001.*

We used factor analysis followed by Structural Equation Modeling (SEM)**,** a robust analysis method used when examining the connections between multiple variables simultaneously (Muthen and Muthen 2012). After the measurement model was analyzed and good fit was obtained, we examined the structural relationships among the latent variables using structural equation modeling. A hypothesized path diagram (structural model) was determined for the resulting factors and a structural model analysis was run in Mplus. The final model was selected based on fit statistics.

RESULTS

To analyze the relationships between religiosity, scientific reasoning ability, creationist beliefs, and evolution acceptance, we tested the hypothesized model of relationships shown in (see Figure 2). The resulting structured model was an excellent fit for the data as indicated by fit statistics and probability scores (TLI = .99; CFI = .97; RMSEA = .07; χ^2 = 544.647, $p < .001$). The vast majority of parameter estimates were statistically significant, as well (see Appendix G). The final model shows that religiosity is a significant direct predictor of creationist views and that religiosity and creationist views are significant indirect and direct predictors, respectively, of acceptance of evolution. The model also shows that scientific reasoning ability does not correlate with religiosity nor does it predict creationist views or acceptance of evolution (Figure 2). The results of the SEM are discussed in further detail below in reference to our three research questions.

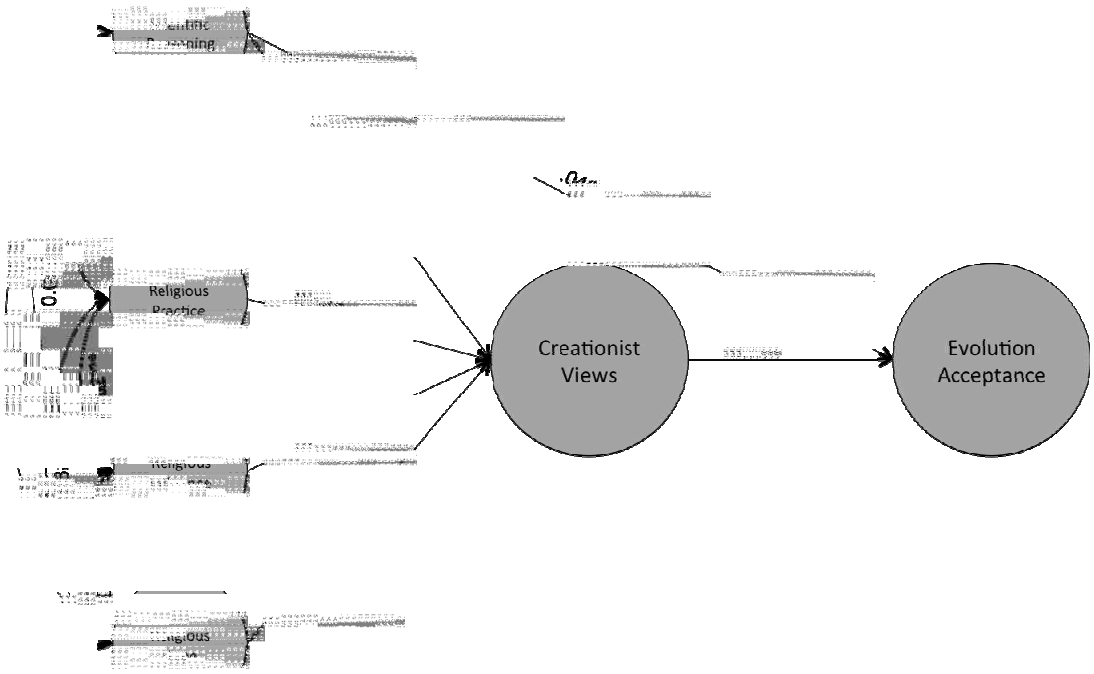

Figure 2. Structural Model*: Culminating structured model from our SEM calculation Bidirectional arrows display correlations while directional arrows display predictive relationships. Significance is noted: *** p < .001.*

(1) Is scientific reasoning ability a significant predictor of religiosity and of creationist views?

From the SEM, none of the three religious factors correlate with scientific reasoning ability, but all three religious factors highly correlate with one another. This means that while all the religious factors have predictive ability of one another, none of them predicted scientific reasoning ability and scientific reasoning ability does not predict any of them. Our measures of religiosity and scientific reasoning are independent measures. Additionally, scientific reasoning ability was not a significant predictor of creationist views.

(2) Is scientific reasoning ability a significant predictor of evolution acceptance?

From the SEM, we can also see that scientific reasoning ability has no relationship with evolution acceptance ($p < .001$). Thus, scientific reasoning ability does not predict one's acceptance of evolutionary theory.

(3) To what degree does religiosity drive creationist views that predict acceptance of evolution?

From the SEM, overall religious hope and influence were determined to be significant predictors of creationist views ($p < .001$), which is in turn a significant predictor of overall acceptance of evolution ($p < .001$; see Figure 2). The indirect effect of religious hope and religious influence on evolution acceptance was also significant ($p < .001$).

DISCUSSION AND CONCLUSIONS

In this study, we aimed to establish the strength and direction of the relationships between religiosity, scientific reasoning ability, and evolution acceptance. Lawson and Weser (1990) speculated that a religious person does not accept evolution because of a limited reasoning ability that prevents such individuals from considering alternative hypotheses. Our research shows that religiosity does influence an individual accepting or rejecting either evolution or creationist views, but there is no relationship between the level of religiosity and scientific reasoning skills. Further, there is not a significant relationship between any factor of religiosity and scientific reasoning. Scientific reasoning and religiosity are separate measures and according to our model one cannot predict the other. Likewise, there is not a significant relationship between creationist views and scientific reasoning. These findings suggest that although religious people often reject evolution, it is not because they are unable to consider alternative explanations or lack scientific

reasoning skills. Findings of the Pew Research Center show that 51% of scientists believe in a higher power (Masci 2009). If having high scientific reasoning ability translates to disbelief in a higher power then number of "believing" scientists should be lower.

Religiosity has a positive relationship with the acceptance of creationist views overall (Figure 2). Because religiosity was broken down into three factors (influence, hope and practice), it is possible to determine which factors were most influential in shaping creationist views. The degree to which religion influences decisions (e.g. what to eat) positively influence creationist views, meaning the more influence religion has on a person's daily choices, the stricter their views of creation. Likewise, how hopeful an individual is positively predicts strictness of creationist views. For example, the more a person hopes for an afterlife or miracles, the more likely he or she is to believe that God created the earth. These findings corroborate Lawson and Worsnop (1992), who found that religious commitment, was a significant predictor of pretest beliefs. However, there is no significant relationship between religious practices (e.g. how often one attends church) and strictness of creationist views. According to the SEM, how often an individual attends church or reads scripture has no bearing on the strictness of their creationist views.

We also determined what religiosity factors were most influential on evolution acceptance. Both religious practices and hope were negative predictors of evolution acceptance. The more hope an individual has (e.g., the stronger the belief in miracles or an afterlife), and the more they adhere to religious practices, the less likely they will be to accept evolution. However, religious influence has no relationship with evolution acceptance. Creationist views are a significant

negative predictor of evolution acceptance ($p < .001$). This suggests that a person who more strongly believes the earth was created by a divine being will be less likely to accept the theory of evolution. While there are some people that embrace both evolution and religion, these results suggest that people overall still view religion and evolution as conflicting or competing forces. Longest and Smith (2011) researched religious and demographic factors that influence whether people view science and religion as conflicting. They found only two consistent factors that increased the chances of a perceived conflict between science and faith: living in the South and believing that the only way to heaven is through Jesus Christ (Longest and Smith 2011). Billingsley et al. (2012) found that high school students who viewed science and religion as contradictory were less interested in exploring the relation between the two. It seems acceptance of evolution is likely affected by an individual's views regarding the relationship between evolution and religion. If this is true, those who view them as compatible may accept evolution more easily.

After examining the influence of creationist views, religiosity, and scientific reasoning on evolution acceptance, the underlying question seems to be regarding the coexistence of religion and evolution. Some suggest that an individual cannot be religious and accept evolution (Coyne 2012). Our data demonstrate that religiosity does not affect scientific reasoning ability. National polls suggest that nearly 40% of Americans still accept a young earth creationist view (Newport 2010), but a more in depth study evaluating confidence in this belief shows that the actual percentage of young earth creationists in the US is likely closer to 15% (Hill 2014). Thus, there is a schism and shift with certain religious beliefs that is dissolving what has historically been a strong negative relationship between creationism and evolution. It is becoming more common

for people of faith to consider evolution as a valid explanation of the biodiversity on earth (Colburn and Henriques 2005; Zimmerman 2010).

Finally, we discuss the role religiosity plays for the religious student who is learning about evolution. A person may reject evolution on the basis of religion but this does not mean they are incapable of considering alternative hypotheses to what they personally believe. Therefore, educators of religious students and student bodies may best reach their students by encouraging them to learn about evolution without disparaging religious belief or setting up an arbitrary conflict between faith and reason.

LIST OF ABBREVIATIONS

ID: Intelligent Design

SEM: Structural Equation Modeling

EFA: Exploratory Factor Analysis

CFA: Confirmatory Factor Analysis

TLI: Tucker-Lewis Index

CFI: Comparative Fit Index

RMSEA: Root Mean Square Error of Approximation

WLSMV: Weighted Least Squares Estimation

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APPENDIX A: Religiosity and Demographic Survey

1. What is your gender?
- ❍ Male
- ❍ Female

2. How many total years of college education have you had?
- ❍ 0
- ❍ 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5

3. How many semesters of biology did you take in high school?
- ❍ 0
- ❍ 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6

4. In which state did you attend High School?

5. What is the highest degree of education earned by your mother?
- ❍ no degree earned
- ❍ high school diploma
- ❍ associate's degree
- ❍ bachelor's degree
- ❍ graduate school degree

6. What is the highest degree of education earned by your father?
- ❍ no degree earned
- ❍ high school diploma
- ❍ associate's degree
- ❍ bachelor's degree
- ❍ graduate school degree

7. How often do you attend religious services and other activities at your place of worship?

- ❍ every week or more often
- ❍ two or three times a month
- ❍ every month or so
- ❍ once or twice a year
- ❍ never

8. Which of the following would describe your answer to the question above?
- ❍ My attendance practices are probably above and beyond that which I feel is expected of me
- ❍ My attendance practices are equal to that which I feel is expected of me
- ❍ My attendance practices are probably less than that which I feel is expected of me

9. From one to five (1=you do not believe / 5=you strongly believe), how strongly do you believe there is life after death?
- ❍ 1 (I do not believe in life after death)
- ❍ 2
- ❍ 3 (I am not sure if there is or is not life after death)
- ❍ 4
- ❍ 5 (I strongly believe that there is life after death)

10. From one to five (1=poor health /5=perfectly health), how healthy do you believe you are?
- ❍ 1 (very poor health)
- ❍ 2
- ❍ 3 (moderate health)
- ❍ 4
- ❍ 5 (perfectly healthy)

11. From one to five (1=not active in religion /5=very active in religion), how religious were you at age 16?
- ❍ 1 (not active in any religion)
- ❍ 2
- ❍ 3 (moderately active in a religion)
- ❍ 4
- ❍ 5 (very active in a religion)

12. From one to five (1=not active in religion /5=very active in religion), how religious are you now?

- ❍ 1 (not active in any religion)
- ❍ 2
- ❍ 3 (moderately active in a religion)
- ❍ 4
- ❍ 5 (very active in a religion)

13. Are you a convert to the LDS faith? (Baptized after the age of 8)
- ❍ Yes
- ❍ No

14. How often does your father attend religious services and other activities at your place of worship?
- ❍ every week or more often
- ❍ two or three times a month
- ❍ every month or so
- ❍ once or twice a year
- ❍ never

15. How often does your mother attend religious services and other activities at your place of worship?
- ❍ every week or more often
- ❍ two or three times a month
- ❍ every month or so
- ❍ once or twice a year
- ❍ never

16. From one to five (1=feel far from God /5=extremely close), how close do you feel to God?
- ❍ 1 (I feel far from God)
- ❍ 2
- ❍ 3 (I feel neither close to, nor far from, God)
- ❍ 4
- ❍ 5 (I feel extremely close to God)

17. How many non-religious groups are you a member of? (Example: clubs, societies, teams, etc
- ❍ 1-2
- ❍ 3-4
- ❍ 5-6
- ❍ 7+

18. From one to five (1= very hesitant / 5=not hesitant at all), how hesitant are you to learning about topics that you feel are confrontational to your religion?

- ❍ 1(very hesitant)
- ❍ 2
- ❍ 3 (somewhat hesitant)
- ❍ 4
- ❍ 5 (not hesitant at all)

19. From one to five (1= never / 5=multiple times a day), how often do you pray?
- ❍ 1 (never)
- ❍ 2
- ❍ 3 (every day or so)
- ❍ 4
- ❍ 5 (multiple times a day)

20. Which of the following would best describe your response to the question above?
- ❍ I pray more often than that which I feel is expected of me
- ❍ I pray as often as that which I feel is expected of me
- ❍ I pray less often than that which I feel is expected of me

21. How many people live in your home?
- ❍ 0
- ❍ 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ 7
- ❍ 8
- ❍ 9
- ❍ 10
- ❍ More than 10

22. Of the people living in your home, how many are members of the LDS faith?
- ❍ 0
- ❍ 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ 7
- ❍ 8
- ❍ 9
- ❍ 10
- ❍ More than 10

23. Did you serve an LDS mission?
- ❍ Yes
- ❍ No

24. Do you study for secular subjects (e.g., do your physics homework, study for a biology exam, etc.) on the Sabbath?
- ❍ All the time
- ❍ Sometimes
- ❍ Never

25. In reference to the question above, how would you rate your response (whether you do or don't)?
- ❍ I feel that what I do is in line with (or required by) the expectations of my religion
- ❍ I feel that what I do may not be in line with the expectations of my religion, but I do it anyway
- ❍ I have never thought about, or have no opinion on, whether what I do is in line with the expectations of my religion or not

26. Referring to your current religious practices, how would you describe yourself?
- ❍ I am probably more religiously active than others in my religion
- ❍ I am probably equal in religious activity to others in my religion
- ❍ I am probably less religiously active than others in my religion

27. How would you best finish the following statement: My religious devotion is:
- ❍ Probably overzealous.
- ❍ Perfectly adequate.
- ❍ Probably not as much as it should be.

APPENDIX B: Survey on Understanding of the LDS View of Evolution (ULSE)

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
The Church of Jesus Christ of Latter-day Saints has official doctrine regarding evolution (including human evolution).	❍	❍	❍	❍	❍	❍
The Church of Jesus Christ of Latter-day Saints is opposed to evolution (including human evolution).	❍	❍	❍	❍	❍	❍
The Church of Jesus Christ of Latter-day Saints holds a neutral position on the topic of evolution (including human evolution).	❍	❍	❍	❍	❍	❍

APPENDIX C: BYU Mission Statement (http://aims.byu.edu/mission_statement)

The mission of Brigham Young University--founded, supported, and guided by The Church of Jesus Christ of Latter-day Saints--is to assist individuals in their quest for perfection and eternal life. That assistance should provide a period of intensive learning in a stimulating setting where a commitment to excellence is expected and the full realization of human potential is pursued.

All instruction, programs, and services at BYU, including a wide variety of extracurricular experiences, should make their own contribution toward the balanced development of the total person. Such a broadly prepared individual will not only be capable of meeting personal challenge and change but will also bring strength to others in the tasks of home and family life, social relationships, civic duty, and service to mankind.

To succeed in this mission the university must provide an environment enlightened by living prophets and sustained by those moral virtues which characterize the life and teachings of the Son of God. In that environment these four major educational goals should prevail:

- All students at BYU should be taught the truths of the gospel of Jesus Christ. Any education is inadequate which does not emphasize that His is the only name given under heaven whereby mankind can be saved. Certainly all relationships within the BYU community should reflect devout love of God and a loving, genuine concern for the welfare of our neighbor.
- Because the gospel encourages the pursuit of all truth, students at BYU should receive a broad university education. The arts, letters, and sciences provide the core of such an education, which will help students think clearly, communicate effectively, understand important ideas in their own cultural tradition as well as that of others, and establish clear standards of intellectual integrity.
- In addition to a strong general education, students should also receive instruction in the special fields of their choice. The university cannot provide programs in all possible areas of professional or vocational work, but in those it does provide the preparation must be excellent. Students who graduate from BYU should be capable of competing with the best in their fields.
- Scholarly research and creative endeavor among both faculty and students, including those in selected graduate programs of real consequence, are essential and will be encouraged.

In meeting these objectives BYU's faculty, staff, students, and administrators should be anxious to make their service and scholarship available to The Church of Jesus Christ of Latter-day Saints in furthering its work worldwide. In an era of limited enrollments, BYU can continue to expand its influence both by encouraging programs that are central to the Church's purposes and by making its resources available to the Church when called upon to do so.

We believe the earnest pursuit of this institutional mission can have a strong effect on the course of higher education and will greatly enlarge Brigham Young University's influence in a world we wish to improve.

--Approved by the BYU Board of Trustees

November 4, 1981

APPENDIX D: Survey with Demographic, Religious Measure, Creationist Views, Evolution Acceptance, and Knowledge of Evolution Questions

Q1.1 My name is Katie Manwaring, I am a graduate student at Brigham Young University and I am conducting this research under the supervision of Professor Bybee, from the Department of Biology. You are being invited to participate in this research study of Evolution and Perceptions of the Religious Population. I am interested in finding out about the effects of religion on a person's attitude and knowledge concerning evolution in biology. We ask that you complete the following survey. This should take approximately 30 minutes of your time. Your participation will be anonymous and you will not be contacted again in the future. You will not be paid for being in this study. This survey involves minimal risk to you. The benefits, however, may impact society by helping increase knowledge about evolution education.Participation in this study is completely voluntary. We will be happy to answer any questions you have about this study. If you have further questions about this project or if you have a research-related problem you may contact me, Katie Manwaring at katiefager@gmail.com or my advisor, Seth Bybee at seth.bybee@gmail.com.If you have any questions about your rights as a research participant you may contact the IRB Administrator at A-285 ASB, Brigham Young University, Provo, UT 84602; irb@byu.edu; (801) 422-1461. The IRB is a group of people who review research studies to protect the rights and welfare of research participants.

The completion of this survey implies your consent to participate. If you choose to participate, please complete the following survey. Thank you!

Demographic Questions

Q1.2 Please select the religious organization that BEST represents your current belief system.

- ❍ Jewish
- ❍ Catholic
- ❍ Southern Baptist
- ❍ LDS (Mormon)
- ❍ None of the above

Q1.3 How old are you?

- ❍ 18-25
- ❍ 26 or older

Q1.4 What is your gender?

- ❍ Male
- ❍ Female

Q1.5 What year were you born?
- ❍ 1914 - 1997

Q1.6 What is your race?
- ❍ American Indian or Alaska Native
- ❍ Asian
- ❍ Black or African American
- ❍ Hispanic or Latino
- ❍ Middle Eastern
- ❍ Native Hawaiian or Pacific Islander
- ❍ White/ Caucasian

Q1.7 How many total years of college education have you completed?
- ❍ 0
- ❍ 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5

Q1.8 What is your major in college?
- ❍ Business
- ❍ Computer Sciences
- ❍ Education
- ❍ Engineering
- ❍ Family, Home, and Social Sciences
- ❍ Fine Arts and Communications
- ❍ Humanities
- ❍ International Studies
- ❍ Life Sciences
- ❍ Nursing or Pre-Medical
- ❍ Physical & Mathematical Sciences
- ❍ Open Major (No current major)
- ❍ I did/have not attended college

Q1.9 Please select the religious organization that BEST represents the belief system under which you were raised (It may be the same as your response above).

- ❍ Agnostic
- ❍ Atheist
- ❍ Spiritual/Not Religious
- ❍ Eastern (Buddhist, Hindu, Confucian)
- ❍ Jewish
- ❍ Muslim
- ❍ Roman Catholic
- ❍ Eastern Orthodox
- ❍ Anglican/Episcopal
- ❍ Baptist
- ❍ LDS
- ❍ Lutheran
- ❍ Methodist
- ❍ Pentecostal
- ❍ Presbyterian
- ❍ Other

Measure of Religious Commitment

Q2.1 Do you believe in God?
- ❍ Yes
- ❍ No

Q2.2 How important is religion in your life?
- ❍ 1 (not at all important)
- ❍ 2 (hardly important)
- ❍ 3 (a little important)
- ❍ 4 (somewhat important)
- ❍ 5 (important)
- ❍ 6 (extremely important)

Q2.3 Would you marry someone of another religion?
- ❍ Yes
- ❍ No

Q2.4 Please select the response that you feel is most like you:

	More than once a day	Once a day	More than once a week	Once a week	More than once a month	Less than once a month
How often do you read holy scriptures?	❍	❍	❍	❍	❍	❍
How often do you attend Sunday School, religious classes or seminars?	❍	❍	❍	❍	❍	❍
How often do you pray?	❍	❍	❍	❍	❍	❍
How often do you attend organized worship services?	❍	❍	❍	❍	❍	❍
How often do you attend other activities sponsored by a religious group?	❍	❍	❍	❍	❍	❍

Q2.5 Please select the response that you feel is most like you:
*If you do you not belong to a religion, answer the questions regarding your current worldview.

	No influence at all	Hardly any influence	Some influence	Moderate influence	A lot of influence	Extreme influence
How much influence do your religious beliefs have on what you wear?	❍	❍	❍	❍	❍	❍
How much influence do your religious beliefs have on what you eat and drink?	❍	❍	❍	❍	❍	❍
How much influence do your religious beliefs have on your choices about whom you associate with?	❍	❍	❍	❍	❍	❍
How much influence do your religious beliefs have on what social activities you undertake?	❍	❍	❍	❍	❍	❍
To what extent do your religious beliefs impact the important decisions that you make?	❍	❍	❍	❍	❍	❍

Q2.6 Please select the response that you feel is most like you:

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
Do you believe there is a heaven?	❍	❍	❍	❍	❍	❍
Do you believe it is possible for all humans to live in harmony together?	❍	❍	❍	❍	❍	❍
Do you believe in miracles?	❍	❍	❍	❍	❍	❍
Do you believe your suffering will be rewarded?	❍	❍	❍	❍	❍	❍
Do you believe that in the future your children will be able to lead a better life than yourself?	❍	❍	❍	❍	❍	❍

Q2.7 Which of the following most closely represents your religion's or worldview's attitude toward evolution?

- ❍ a. openly advocates the theory of evolution
- ❍ b. tentatively advocates the theory of evolution
- ❍ c. is neutral concerning the theory of evolution
- ❍ d. tentatively rejects the theory of evolution
- ❍ e. openly rejects the theory of evolution

Q2.8 To what degree do you agree with your religion's or worldview's attitude toward evolution?

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Agree
- ❍ Strongly Agree

Creationist Views

Q3.1 Please choose to what degree you agree with/endorse the following statements.

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
God created the earth and all living organisms.	❍	❍	❍	❍	❍	❍
All creatures were created independently of each other.	❍	❍	❍	❍	❍	❍
The earth was created in 6 days.	❍	❍	❍	❍	❍	❍
Life on earth as it is, is indicative of a "creator."	❍	❍	❍	❍	❍	❍
Humans were directly created (by God) from the dust of the earth.	❍	❍	❍	❍	❍	❍
The fall of Adam was the beginning of death on the earth.	❍	❍	❍	❍	❍	❍
The earth was created in the last 10,000 years.	❍	❍	❍	❍	❍	❍

Q3.2 Please choose to what degree you agree with/endorse the following statements.

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
Holy scriptures are to be interpreted literally.	❍	❍	❍	❍	❍	❍
Adam and Eve were the first humans on earth.	❍	❍	❍	❍	❍	❍
All creatures on earth were created in the last 10,000 years.	❍	❍	❍	❍	❍	❍
The organisms God created are perfect.	❍	❍	❍	❍	❍	❍
All present day humans are direct descendants of Adam and Eve.	❍	❍	❍	❍	❍	❍
Species do not change.	❍	❍	❍	❍	❍	❍
	❍	❍	❍	❍	❍	❍

Q3.3 What most influenced your answers to the above statements?

- ❍ Religious Authority
- ❍ Family Influence
- ❍ Personal Study/Experience
- ❍ Instinct

Acceptance of Evolution

Q3.4 Please choose to what degree you agree with/endorse the following statements.

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
Evolution is the best explanation for life on Earth.	❍	❍	❍	❍	❍	❍
There were many human-like species before modern-day humans.	❍	❍	❍	❍	❍	❍
Fossils are evidence of extinct organisms.	❍	❍	❍	❍	❍	❍
All organisms share similar DNA because they have descended from a common ancestor.	❍	❍	❍	❍	❍	❍
The scientific process is the best way to gain knowledge of the present and historical state of the Earth.	❍	❍	❍	❍	❍	❍
The most likely age of the Earth is billions of years old.	❍	❍	❍	❍	❍	❍

Q3.5 Please choose to what degree you agree with/endorse the following statements.

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
The laws of nature govern the phenomena of the Earth.	❍	❍	❍	❍	❍	❍
Evolution provides the best explanation for the origin of modern-day humans.	❍	❍	❍	❍	❍	❍
The Earth and life on it have developed over a vast amount of time.	❍	❍	❍	❍	❍	❍
Evolution can maintain organisms with many flaws.	❍	❍	❍	❍	❍	❍
Humans developed from earlier life forms.	❍	❍	❍	❍	❍	❍
New species can be generated from one original species.	❍	❍	❍	❍	❍	❍

Knowledge of Evolution

The following sixteen questions test your knowledge of evolution. There is a correct answer to each question. Please answer to the best of your ability.

Q4.1 Which of the following best describes the relationship between evolution and natural selection?

- ❍ a. natural selection is a random process whereas evolution proceeds toward a specific goal
- ❍ b. natural selection is differential survival of populations or groups, resulting in the evolution of individual organisms
- ❍ c. natural selection is one mechanism that can result in the process of evolution
- ❍ d. natural selection produces small-scale changes in populations, whereas evolution produces large-scale ones
- ❍ e. they are equivalent terms describing the same process

Q4.2 Which of the following concerning the theory of human evolution is true?

- ❍ a. evolutionary theory cannot help us explain, scientifically, human behavior
- ❍ b. the human population is not currently evolving
- ❍ c. there is very little evidence to support the theory of human evolution
- ❍ d. traces of our evolutionary past can be seen in human embryos
- ❍ e. none of the above is true

Q4.3 A typical layer of rock is _____ than the layer above.

- ❍ a. older
- ❍ b. younger
- ❍ c. the same age
- ❍ d. This issue cannot be determined.

Q4.4 Which of the following is the ultimate source of new variation in natural populations?

- ❍ a. gene flow
- ❍ b. hybridization
- ❍ c. mutation
- ❍ d. natural selection
- ❍ e. recombination

Q4.5 What is a change in the genetic makeup of a population of organisms through time?

- ❍ a. adaptive radiation
- ❍ b. biological evolution
- ❍ c. genetic recombination
- ❍ d. Lamarckian evolution
- ❍ e. natural selection

Q4.6 Which species of present-day apes are most closely related to present-day humans?

- ❍ a. Chimpanzees
- ❍ b. Gibbons
- ❍ c. Gorillas
- ❍ d. Orangutans

Q4.7 What scientific avenue of investigation gave scientists the best estimate of the age of the Earth?

- ❍ a. dating fossils
- ❍ b. archaeological dating
- ❍ c. radiometric dating
- ❍ d. carbon dating
- ❍ e. all of the above

Q4.8 Which of the following statements about natural selection is true?

- ❍ a. all individuals within a population have an equal chance of survival and reproduction; survival is based on choice
- ❍ b. natural selection causes variation to arise within a population
- ❍ c. natural selection leads to extinction
- ❍ d. natural selection leads to increase likelihood of survival for certain individuals based on variation. The variation comes from outside the population
- ❍ e. natural selection results in those individuals within a population who are best-adapted surviving and producing more offspring

Q4.9 Which of the following is the most fit in an evolutionary sense?

- ❍ a. a lion who cares for his cubs, two of whom live to adulthood
- ❍ b. a lion who has a harem of many lionesses and one cub
- ❍ c. a lion who has many cubs, eight of which live to adulthood
- ❍ d. a lion who is successful at capturing prey but has no cubs
- ❍ e. a lion who overcomes a disease and lives to have three cubs

Q4.10 Which of the following support the theory of human evolution?

- a. comparative biochemistry, where similarities and differences of DNA among species can be quantified
- b. comparative embryology, where the evolutionary history of similar structures can often be traced
- c. fossil record of transition fossils showing how certain features have evolved
- d. vestigial structures that serve no apparent purpose
- e. all of the above provide evidence to support the theory of evolution

Q4.11 What would you expect to find living on earth a million years from now?

- a. Only new organisms; all organisms would have evolved
- b. The same organisms that are here now
- c. Some of the same organisms that are here now and some new ones
- d. The same organisms that are here now and a few that were previously extinct

Q4.12 How might a biologist explain why a species of birds has evolved a larger beak size?

- a. large beak size occurred as a result of mutation in each member of the population
- b. some members of the ancestral population had larger beaks than others. If larger beak size was advantageous, they would be more likely to survive and reproduce. As such, large beaked birds increased in frequency relative to small beaked birds
- c. the ancestors of this bird species encountered a tree with larger than average sized seeds. They discovered that by stretching their beaks, the beaks would get longer, and this increase was passed on to their offspring. Over time, the bird beaks became larger
- d. the ancestors of this bird species encountered a tree with larger than average sized seeds. They needed to develop larger beaks to eat the larger seeds, and over time, they adapted to meet this need
- e. none of the above

Q4.13 CHOOSE THE OPTION THAT IS NOT CORRECT: Which of the following statements regarding evolution by natural selection is FALSE?

- a. mutations are important as the ultimate source of genetic variability upon which natural selection can act
- b. natural selection acts on individuals
- c. natural selection can result in the elimination of certain alleles from a population's gene pool
- d. natural selection is a random process
- e. very small selective advantages can produce large effects through time
- f. all of the above are false

Q4.14 All organisms, including humans, share the same genetic code. This commonality is evidence that…

- a. evolution is occurring now
- b. convergent evolution has occurred
- c. evolution occurs gradually
- d. all organisms are descended from a common ancestor
- e. life began millions of years ago

Q4.15 Scientists estimate the age of the Earth to be about

- a. 6,000 years old
- b. 1 million years old
- c. 4.5 million years old
- d. 4.5 billion years old

Q4.16 Resistance to a wide variety of insecticides has recently evolved in many species of insects. Why?

- a. humans are altering the environments of these organisms, and the organisms are evolving by natural selection
- b. humans have better health practices, so these organisms are trying to keep up
- c. insects are smarter than humans
- d. mutations are on the rise
- e. no new species are evolving, just resistant strains or varieties; this is not evolution by natural selection

APPENDIX E: SEM Output for Religious Affiliation by Evolution Acceptance

Mplus VERSION 5.21
MUTHEN & MUTHEN
11/24/2015 11:54 AM

INPUT INSTRUCTIONS

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  TITLE:     Acceptance of Evolution BY RELGROUP_SEM
             Final Partial Invariance Model from Separate
             multigroup models for each factor
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             RElig06 Relig07 Relig08 Relig09 RElig10
             RElig11 RElig12 Relig13 RElig14 RElig15
             Relig16 Relig17 Relig18 View01  View02
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               ACRS07  ACRS08  ACRS09  ACRS10  ACRS11  ACRS12  ACRS13
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             ACSS01  ACSS02  ACSS03  ACSS04  ACSS05  ACSS06  ACSS07
             ACSS08  ACSS09  ACSS10  ACSS11  ACSS12
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             Relig09 RElig10 RElig11 RElig12 Relig13
             RElig14 Relig15 Relig16 Relig17 Relig18
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               ACRS07 ACRS08 ACRS09       ACRS11       ACRS13
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             ACSS08  ACSS09  ACSS10  ACSS11  ACSS12;
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    GROUPING= RelAffil(1=Baptist 2=Catholic 3=Jewish 4=LDS);

   DEFINE:
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   IF relig14==1 THEN relig14=2;
   IF relig16==1 THEN relig16=2;
   IF ACRS01==1 THEN ACRS01=3;
   IF ACRS01==2 THEN ACRS01=3;


   ANALYSIS:

   MODEL:
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RInfluen By Relig09 Relig10 Relig11 Relig12 Relig13;

RHope BY    Relig14 Relig15 RElig16 Relig17 Relig18;

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RBeliefs ON RInfluen (b);
RBeliefs ON RHope (c);
RBeliefs ON Rpractic (d);

SciAccep ON  RInfluen (e);
SciAccep ON  RHope(f);
SciAccep ON  Rpractic (g);


  MODEL BAPTIST:

SciAccep ON  RBeliefs (a);

RBeliefs ON RInfluen (b);
RBeliefs ON RHope (c);

!This is supposed to vary for Baptist;
RBeliefs ON Rpractic;

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SciAccep ON  RHope(f);
SciAccep ON  Rpractic (g);
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RBeliefs ON RHope (c);
RBeliefs ON Rpractic (d);

SciAccep ON  RInfluen (e);
SciAccep ON  RHope(f);
SciAccep ON  Rpractic (g);

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RBeliefs ON RInfluen (b);
!This is supposed to vary for Jewish only!
RBeliefs ON RHope;
RBeliefs ON Rpractic (d);

SciAccep ON  RInfluen (e);
SciAccep ON  RHope(f);
SciAccep ON  Rpractic (g);
```

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        [RElig11$2-relig11$5];
        [RElig12$2-relig12$5];
        [Relig13$2-relig13$5];
        [RElig14$3-relig14$4];
        [Relig15$2-relig15$5];
        [Relig16$2-relig16$4];
        [Relig17$2-relig17$5];
        [Relig18$2-relig18$5];
        [ACRS01$3];
        [ACRS02$2-acrs02$5];
        [ACRS03$2-acrs03$5];
        [ACRS04$2-acrs04$5];
        [ACRS05$2-acrs05$5];
        [ACRS06$2-acrs06$5];
        [ACRS07$2-acrs07$5];
        [ACRS08$2-acrs08$5];
        [ACRS09$2-acrs09$5];
        [ACRS11$2-acrs11$5];
        [ACRS13$2-acrs13$5];
        [ACSS01$3-acss01$5];
        [ACSS02$2-acss02$5];
        [ACSS03$2-acss03$5];
        [ACSS04$2-acss04$5];
        [ACSS05$2-acss05$5];
        [ACSS06$2-acss06$5];
        [ACSS07$2-acss07$5];
        [ACSS08$2-acss08$5];
        [ACSS09$2-acss09$5];
        [ACSS10$2-acss10$5];
        [ACSS11$2-acss11$5];
        [ACSS12$2-acss12$5];

SciAccep ON  RBeliefs (a);
RBeliefs ON RInfluen (b);
RBeliefs ON RHope (c);
RBeliefs ON Rpractic (d);
```

```
  SciAccep ON  RInfluen (e);
  SciAccep ON  RHope(f);
  SciAccep ON  Rpractic (g);
  [SciAccep@0];
  [Rbeliefs](h);

    OUTPUT: STDYX Modindices(20);
```

INPUT READING TERMINATED NORMALLY

Acceptance of Evolution BY RELGROUP_SEM
Final Partial Invariance Model from Separate
multigroup models for each factor

SUMMARY OF ANALYSIS

Number of groups	4
Number of observations	
Group BAPTIST	182
Group CATHOLIC	182
Group JEWISH	178
Group LDS	182
Number of dependent variables	37
Number of independent variables	0
Number of continuous latent variables	5

Observed dependent variables

Binary and ordered categorical (ordinal)
RELIG04 RELIG05 RELIG07 RELIG08 RELIG09 RELIG10
RELIG11 RELIG12 RELIG13 RELIG14 RELIG15 RELIG16
RELIG17 RELIG18 ACRS01 ACRS02 ACRS03 ACRS04
ACRS05 ACRS06 ACRS07 ACRS08 ACRS09 ACRS11
ACRS13 ACSS01 ACSS02 ACSS03 ACSS04 ACSS05
ACSS06 ACSS07 ACSS08 ACSS09 ACSS10 ACSS11
ACSS12

Continuous latent variables
SCIACCEP RBELIEFS RPRACTIC RINFLUEN RHOPE

Variables with special functions

Grouping variable RELAFFIL

Estimator	WLSMV
Maximum number of iterations	1000
Convergence criterion	0.500D-04
Maximum number of steepest descent iterations	20
Parameterization	DELTA

Input data file(s)
FAll2014_Panel_Responses.txt

Input data format FREE

SUMMARY OF CATEGORICAL DATA PROPORTIONS

Group BAPTIST

RELIG04	
Category 1	0.379
Category 2	0.077
Category 3	0.126
Category 4	0.121
Category 5	0.198
Category 6	0.099
RELIG05	
Category 1	0.533
Category 2	0.055
Category 3	0.258
Category 4	0.137
Category 5	0.005
Category 6	0.011
RELIG07	
Category 1	0.440
Category 2	0.099
Category 3	0.280
Category 4	0.154
Category 5	0.027
RELIG08	
Category 1	0.604
Category 2	0.187
Category 3	0.115
Category 4	0.066
Category 5	0.022
Category 6	0.005
RELIG09	
Category 1	0.291
Category 2	0.181
Category 3	0.214
Category 4	0.159
Category 5	0.082
Category 6	0.071
RELIG10	
Category 1	0.467
Category 2	0.187
Category 3	0.143
Category 4	0.099
Category 5	0.066
Category 6	0.038
RELIG11	
Category 1	0.176
Category 2	0.165
Category 3	0.214
Category 4	0.187
Category 5	0.187
Category 6	0.071
RELIG12	
Category 1	0.181
Category 2	0.137
Category 3	0.258
Category 4	0.159
Category 5	0.148
Category 6	0.115
RELIG13	
Category 1	0.099
Category 2	0.066
Category 3	0.154
Category 4	0.154
Category 5	0.269
Category 6	0.258
RELIG14	
Category 1	0.016
Category 2	0.005
Category 3	0.038
Category 4	0.143
Category 5	0.797
RELIG15	
Category 1	0.088
Category 2	0.159
Category 3	0.088
Category 4	0.236
Category 5	0.121
Category 6	0.308
RELIG16	
Category 1	0.011
Category 2	0.011
Category 3	0.115
Category 4	0.247
Category 5	0.615
RELIG17	
Category 1	0.027

Category 2	0.038
Category 3	0.071
Category 4	0.187
Category 5	0.242
Category 6	0.434
RELIG18	
Category 1	0.027
Category 2	0.060
Category 3	0.082
Category 4	0.159
Category 5	0.269
Category 6	0.401
ACRS01	
Category 1	0.022
Category 2	0.049
Category 3	0.148
Category 4	0.780
ACRS02	
Category 1	0.121
Category 2	0.049
Category 3	0.077
Category 4	0.148
Category 5	0.198
Category 6	0.407
ACRS03	
Category 1	0.055
Category 2	0.038
Category 3	0.055
Category 4	0.099
Category 5	0.132
Category 6	0.621
ACRS04	
Category 1	0.022
Category 2	0.022
Category 3	0.022
Category 4	0.104
Category 5	0.176
Category 6	0.654
ACRS05	
Category 1	0.022
Category 2	0.044
Category 3	0.033
Category 4	0.093
Category 5	0.148
Category 6	0.659
ACRS06	
Category 1	0.027
Category 2	0.060
Category 3	0.071
Category 4	0.148
Category 5	0.132
Category 6	0.560
ACRS07	
Category 1	0.247
Category 2	0.143
Category 3	0.132
Category 4	0.132
Category 5	0.099
Category 6	0.247
ACRS08	
Category 1	0.066
Category 2	0.088
Category 3	0.104
Category 4	0.258
Category 5	0.209
Category 6	0.275
ACRS09	
Category 1	0.044
Category 2	0.027
Category 3	0.055
Category 4	0.099
Category 5	0.198
Category 6	0.577
ACRS11	
Category 1	0.088
Category 2	0.115
Category 3	0.110
Category 4	0.143
Category 5	0.148
Category 6	0.396
ACRS13	
Category 1	0.176
Category 2	0.247
Category 3	0.187
Category 4	0.121
Category 5	0.110
Category 6	0.159
ACSS01	
Category 1	0.368
Category 2	0.176
Category 3	0.115
Category 4	0.143
Category 5	0.088
Category 6	0.110
ACSS02	
Category 1	0.297
Category 2	0.121
Category 3	0.132
Category 4	0.220
Category 5	0.126
Category 6	0.104
ACSS03	
Category 1	0.049
Category 2	0.011
Category 3	0.071
Category 4	0.181
Category 5	0.313
Category 6	0.374
ACSS04	
Category 1	0.181
Category 2	0.121
Category 3	0.176
Category 4	0.225
Category 5	0.170
Category 6	0.126
ACSS05	
Category 1	0.154
Category 2	0.143
Category 3	0.187
Category 4	0.253
Category 5	0.159
Category 6	0.104
ACSS06	
Category 1	0.181
Category 2	0.077
Category 3	0.115
Category 4	0.154
Category 5	0.214
Category 6	0.258
ACSS07	
Category 1	0.143
Category 2	0.110
Category 3	0.170
Category 4	0.286
Category 5	0.192
Category 6	0.099
ACSS08	
Category 1	0.357

Category 2	0.176
Category 3	0.154
Category 4	0.121
Category 5	0.115
Category 6	0.077
ACSS09	
Category 1	0.176
Category 2	0.055
Category 3	0.099
Category 4	0.247
Category 5	0.214
Category 6	0.209
ACSS10	
Category 1	0.225
Category 2	0.082
Category 3	0.225
Category 4	0.214
Category 5	0.176
Category 6	0.077
ACSS11	
Category 1	0.418
Category 2	0.143
Category 3	0.099
Category 4	0.104
Category 5	0.148
Category 6	0.088
ACSS12	
Category 1	0.203
Category 2	0.132
Category 3	0.110
Category 4	0.242
Category 5	0.192
Category 6	0.121
Group CATHOLIC	
RELIG04	
Category 1	0.582
Category 2	0.088
Category 3	0.176
Category 4	0.082
Category 5	0.060
Category 6	0.011
RELIG05	
Category 1	0.665
Category 2	0.038
Category 3	0.225
Category 4	0.049
Category 5	0.011
Category 6	0.011
RELIG07	
Category 1	0.500
Category 2	0.110
Category 3	0.302
Category 4	0.071
Category 5	0.016
RELIG08	
Category 1	0.709
Category 2	0.115
Category 3	0.104
Category 4	0.049
Category 5	0.016
Category 6	0.005
RELIG09	
Category 1	0.462
Category 2	0.203
Category 3	0.181
Category 4	0.093
Category 5	0.049
Category 6	0.011
RELIG10	
Category 1	0.462
Category 2	0.264
Category 3	0.115
Category 4	0.093
Category 5	0.049
Category 6	0.016
RELIG11	
Category 1	0.401
Category 2	0.214
Category 3	0.143
Category 4	0.115
Category 5	0.115
Category 6	0.011
RELIG12	
Category 1	0.385
Category 2	0.187
Category 3	0.214
Category 4	0.110
Category 5	0.093
Category 6	0.011
RELIG13	
Category 1	0.181
Category 2	0.148
Category 3	0.236
Category 4	0.203
Category 5	0.159
Category 6	0.071
RELIG14	
Category 1	0.022
Category 2	0.033
Category 3	0.154
Category 4	0.231
Category 5	0.560
RELIG15	
Category 1	0.044
Category 2	0.082
Category 3	0.110
Category 4	0.203
Category 5	0.297
Category 6	0.264
RELIG16	
Category 1	0.038
Category 2	0.038
Category 3	0.154
Category 4	0.291
Category 5	0.478
RELIG17	
Category 1	0.049
Category 2	0.049
Category 3	0.110
Category 4	0.247
Category 5	0.247
Category 6	0.297
RELIG18	
Category 1	0.016
Category 2	0.033
Category 3	0.093
Category 4	0.214
Category 5	0.330
Category 6	0.313
ACRS01	
Category 1	0.198
Category 2	0.159
Category 3	0.203
Category 4	0.440
ACRS02	
Category 1	0.104
Category 2	0.115

Category 3	0.170
Category 4	0.225
Category 5	0.198
Category 6	0.187
ACRS03	
Category 1	0.176
Category 2	0.104
Category 3	0.165
Category 4	0.176
Category 5	0.148
Category 6	0.231
ACRS04	
Category 1	0.055
Category 2	0.071
Category 3	0.115
Category 4	0.236
Category 5	0.214
Category 6	0.308
ACRS05	
Category 1	0.104
Category 2	0.115
Category 3	0.148
Category 4	0.170
Category 5	0.148
Category 6	0.313
ACRS06	
Category 1	0.148
Category 2	0.154
Category 3	0.126
Category 4	0.192
Category 5	0.165
Category 6	0.214
ACRS07	
Category 1	0.319
Category 2	0.159
Category 3	0.154
Category 4	0.159
Category 5	0.121
Category 6	0.088
ACRS08	
Category 1	0.214
Category 2	0.192
Category 3	0.198
Category 4	0.203
Category 5	0.132
Category 6	0.060
ACRS09	
Category 1	0.154
Category 2	0.077
Category 3	0.137
Category 4	0.192
Category 5	0.181
Category 6	0.258
ACRS11	
Category 1	0.137
Category 2	0.176
Category 3	0.192
Category 4	0.187
Category 5	0.126
Category 6	0.181
ACRS13	
Category 1	0.374
Category 2	0.214
Category 3	0.198
Category 4	0.082
Category 5	0.071
Category 6	0.060
ACSS01	
Category 1	0.121
Category 2	0.082
Category 3	0.115
Category 4	0.258
Category 5	0.225
Category 6	0.198
ACSS02	
Category 1	0.055
Category 2	0.077
Category 3	0.132
Category 4	0.280
Category 5	0.236
Category 6	0.220
ACSS03	
Category 1	0.005
Category 2	0.022
Category 3	0.027
Category 4	0.165
Category 5	0.368
Category 6	0.412
ACSS04	
Category 1	0.055
Category 2	0.088
Category 3	0.132
Category 4	0.319
Category 5	0.220
Category 6	0.187
ACSS05	
Category 1	0.038
Category 2	0.066
Category 3	0.126
Category 4	0.275
Category 5	0.253
Category 6	0.242
ACSS06	
Category 1	0.033
Category 2	0.027
Category 3	0.071
Category 4	0.220
Category 5	0.291
Category 6	0.357
ACSS07	
Category 1	0.033
Category 2	0.038
Category 3	0.126
Category 4	0.341
Category 5	0.275
Category 6	0.187
ACSS08	
Category 1	0.088
Category 2	0.071
Category 3	0.099
Category 4	0.192
Category 5	0.346
Category 6	0.203
ACSS09	
Category 1	0.027
Category 2	0.022
Category 3	0.071
Category 4	0.242
Category 5	0.264
Category 6	0.374
ACSS10	
Category 1	0.055
Category 2	0.060
Category 3	0.077
Category 4	0.258
Category 5	0.335
Category 6	0.214
ACSS11	

Category 1 0.104
Category 2 0.055
Category 3 0.132
Category 4 0.203
Category 5 0.236
Category 6 0.269
ACSS12
Category 1 0.055
Category 2 0.033
Category 3 0.132
Category 4 0.286
Category 5 0.275
Category 6 0.220

Group JEWISH
RELIG04
Category 1 0.713
Category 2 0.034
Category 3 0.090
Category 4 0.051
Category 5 0.045
Category 6 0.067
RELIG05
Category 1 0.758
Category 2 0.073
Category 3 0.079
Category 4 0.034
Category 5 0.022
Category 6 0.034
RELIG07
Category 1 0.674
Category 2 0.096
Category 3 0.140
Category 4 0.045
Category 5 0.045
RELIG08
Category 1 0.691
Category 2 0.169
Category 3 0.067
Category 4 0.039
Category 5 0.017
Category 6 0.017
RELIG09
Category 1 0.596
Category 2 0.174
Category 3 0.084
Category 4 0.039
Category 5 0.056
Category 6 0.051
RELIG10
Category 1 0.399
Category 2 0.124
Category 3 0.152
Category 4 0.101
Category 5 0.124
Category 6 0.101
RELIG11
Category 1 0.444
Category 2 0.191
Category 3 0.157
Category 4 0.090
Category 5 0.067
Category 6 0.051
RELIG12
Category 1 0.466
Category 2 0.169
Category 3 0.163
Category 4 0.096
Category 5 0.062
Category 6 0.045
RELIG13
Category 1 0.270
Category 2 0.225
Category 3 0.197
Category 4 0.140
Category 5 0.096
Category 6 0.073
RELIG14
Category 1 0.213
Category 2 0.101
Category 3 0.264
Category 4 0.174
Category 5 0.247
RELIG15
Category 1 0.079
Category 2 0.096
Category 3 0.169
Category 4 0.247
Category 5 0.202
Category 6 0.208
RELIG16
Category 1 0.174
Category 2 0.112
Category 3 0.320
Category 4 0.185
Category 5 0.208
RELIG17
Category 1 0.185
Category 2 0.219
Category 3 0.180
Category 4 0.180
Category 5 0.124
Category 6 0.112
RELIG18
Category 1 0.051
Category 2 0.045
Category 3 0.101
Category 4 0.371
Category 5 0.247
Category 6 0.185
ACRS01
Category 1 0.455
Category 2 0.197
Category 3 0.135
Category 4 0.213
ACRS02
Category 1 0.213
Category 2 0.124
Category 3 0.174
Category 4 0.174
Category 5 0.185
Category 6 0.129
ACRS03
Category 1 0.416
Category 2 0.146
Category 3 0.101
Category 4 0.118
Category 5 0.067
Category 6 0.152
ACRS04
Category 1 0.247
Category 2 0.112
Category 3 0.118
Category 4 0.169
Category 5 0.163
Category 6 0.191
ACRS05
Category 1 0.382

Category 2	0.157
Category 3	0.124
Category 4	0.096
Category 5	0.084
Category 6	0.157
ACRS06	
Category 1	0.404
Category 2	0.230
Category 3	0.090
Category 4	0.067
Category 5	0.101
Category 6	0.107
ACRS07	
Category 1	0.545
Category 2	0.107
Category 3	0.090
Category 4	0.090
Category 5	0.084
Category 6	0.084
ACRS08	
Category 1	0.517
Category 2	0.180
Category 3	0.146
Category 4	0.062
Category 5	0.056
Category 6	0.039
ACRS09	
Category 1	0.404
Category 2	0.129
Category 3	0.067
Category 4	0.135
Category 5	0.118
Category 6	0.146
ACRS11	
Category 1	0.444
Category 2	0.157
Category 3	0.135
Category 4	0.079
Category 5	0.107
Category 6	0.079
ACRS13	
Category 1	0.607
Category 2	0.197
Category 3	0.090
Category 4	0.056
Category 5	0.011
Category 6	0.039
ACSS01	
Category 1	0.118
Category 2	0.051
Category 3	0.045
Category 4	0.185
Category 5	0.298
Category 6	0.303
ACSS02	
Category 1	0.067
Category 2	0.045
Category 3	0.067
Category 4	0.197
Category 5	0.354
Category 6	0.270
ACSS03	
Category 1	0.034
Category 2	0.011
Category 3	0.017
Category 4	0.084
Category 5	0.303
Category 6	0.551
ACSS04	
Category 1	0.067
Category 2	0.067
Category 3	0.135
Category 4	0.258
Category 5	0.242
Category 6	0.230
ACSS05	
Category 1	0.039
Category 2	0.028
Category 3	0.067
Category 4	0.129
Category 5	0.320
Category 6	0.416
ACSS06	
Category 1	0.067
Category 2	0.039
Category 3	0.056
Category 4	0.101
Category 5	0.225
Category 6	0.511
ACSS07	
Category 1	0.045
Category 2	0.028
Category 3	0.067
Category 4	0.197
Category 5	0.360
Category 6	0.303
ACSS08	
Category 1	0.090
Category 2	0.028
Category 3	0.045
Category 4	0.169
Category 5	0.264
Category 6	0.404
ACSS09	
Category 1	0.051
Category 2	0.011
Category 3	0.022
Category 4	0.107
Category 5	0.247
Category 6	0.562
ACSS10	
Category 1	0.062
Category 2	0.034
Category 3	0.073
Category 4	0.163
Category 5	0.298
Category 6	0.371
ACSS11	
Category 1	0.079
Category 2	0.034
Category 3	0.039
Category 4	0.124
Category 5	0.292
Category 6	0.433
ACSS12	
Category 1	0.062
Category 2	0.028
Category 3	0.067
Category 4	0.247
Category 5	0.281
Category 6	0.315
Group LDS	
RELIG04	
Category 1	0.203
Category 2	0.088
Category 3	0.099
Category 4	0.313

Category 5	0.258
Category 6	0.038
RELIG05	
Category 1	0.247
Category 2	0.055
Category 3	0.544
Category 4	0.137
Category 5	0.011
Category 6	0.005
RELIG07	
Category 1	0.220
Category 2	0.055
Category 3	0.604
Category 4	0.088
Category 5	0.033
RELIG08	
Category 1	0.445
Category 2	0.275
Category 3	0.121
Category 4	0.121
Category 5	0.016
Category 6	0.022
RELIG09	
Category 1	0.082
Category 2	0.088
Category 3	0.148
Category 4	0.137
Category 5	0.242
Category 6	0.302
RELIG10	
Category 1	0.082
Category 2	0.093
Category 3	0.110
Category 4	0.115
Category 5	0.291
Category 6	0.308
RELIG11	
Category 1	0.104
Category 2	0.115
Category 3	0.159
Category 4	0.209
Category 5	0.269
Category 6	0.143
RELIG12	
Category 1	0.077
Category 2	0.071
Category 3	0.143
Category 4	0.203
Category 5	0.275
Category 6	0.231
RELIG13	
Category 1	0.055
Category 2	0.016
Category 3	0.126
Category 4	0.165
Category 5	0.297
Category 6	0.341
RELIG14	
Category 1	0.005
Category 2	0.011
Category 3	0.049
Category 4	0.104
Category 5	0.830
RELIG15	
Category 1	0.022
Category 2	0.027
Category 3	0.082
Category 4	0.176
Category 5	0.253
Category 6	0.440
RELIG16	
Category 1	0.005
Category 2	0.016
Category 3	0.082
Category 4	0.192
Category 5	0.703
RELIG17	
Category 1	0.027
Category 2	0.016
Category 3	0.060
Category 4	0.154
Category 5	0.302
Category 6	0.440
RELIG18	
Category 1	0.011
Category 2	0.022
Category 3	0.038
Category 4	0.181
Category 5	0.324
Category 6	0.423
ACRS01	
Category 1	0.027
Category 2	0.049
Category 3	0.165
Category 4	0.758
ACRS02	
Category 1	0.049
Category 2	0.049
Category 3	0.137
Category 4	0.170
Category 5	0.192
Category 6	0.401
ACRS03	
Category 1	0.104
Category 2	0.082
Category 3	0.055
Category 4	0.121
Category 5	0.203
Category 6	0.434
ACRS04	
Category 1	0.022
Category 2	0.027
Category 3	0.033
Category 4	0.055
Category 5	0.198
Category 6	0.665
ACRS05	
Category 1	0.049
Category 2	0.027
Category 3	0.066
Category 4	0.176
Category 5	0.181
Category 6	0.500
ACRS06	
Category 1	0.044
Category 2	0.027
Category 3	0.082
Category 4	0.121
Category 5	0.209
Category 6	0.516
ACRS07	
Category 1	0.203
Category 2	0.181
Category 3	0.121
Category 4	0.176
Category 5	0.148
Category 6	0.170
ACRS08	

Category 1	0.060	Category 3	0.209	Category 5	0.225
Category 2	0.148	Category 4	0.269	Category 6	0.159
Category 3	0.231	Category 5	0.143	ACSS08	
Category 4	0.247	Category 6	0.060	Category 1	0.286
Category 5	0.170	ACSS03		Category 2	0.170
Category 6	0.143	Category 1	0.016	Category 3	0.209
ACRS09		Category 2	0.016	Category 4	0.192
Category 1	0.027	Category 3	0.044	Category 5	0.071
Category 2	0.011	Category 4	0.231	Category 6	0.071
Category 3	0.044	Category 5	0.368	ACSS09	
Category 4	0.132	Category 6	0.324	Category 1	0.066
Category 5	0.209	ACSS04		Category 2	0.044
Category 6	0.577	Category 1	0.071	Category 3	0.099
ACRS11		Category 2	0.148	Category 4	0.308
Category 1	0.077	Category 3	0.176	Category 5	0.264
Category 2	0.093	Category 4	0.291	Category 6	0.220
Category 3	0.121	Category 5	0.187	ACSS10	
Category 4	0.159	Category 6	0.126	Category 1	0.093
Category 5	0.209	ACSS05		Category 2	0.071
Category 6	0.341	Category 1	0.110	Category 3	0.247
ACRS13		Category 2	0.121	Category 4	0.302
Category 1	0.264	Category 3	0.214	Category 5	0.176
Category 2	0.236	Category 4	0.297	Category 6	0.110
Category 3	0.170	Category 5	0.148	ACSS11	
Category 4	0.126	Category 6	0.110	Category 1	0.341
Category 5	0.099	ACSS06		Category 2	0.132
Category 6	0.104	Category 1	0.077	Category 3	0.187
ACSS01		Category 2	0.060	Category 4	0.176
Category 1	0.247	Category 3	0.154	Category 5	0.077
Category 2	0.203	Category 4	0.280	Category 6	0.088
Category 3	0.242	Category 5	0.203	ACSS12	
Category 4	0.159	Category 6	0.225	Category 1	0.148
Category 5	0.099	ACSS07		Category 2	0.115
Category 6	0.049	Category 1	0.027	Category 3	0.198
ACSS02		Category 2	0.104	Category 4	0.247
Category 1	0.165	Category 3	0.132	Category 5	0.181
Category 2	0.154	Category 4	0.352	Category 6	0.110

THE MODEL ESTIMATION TERMINATED NORMALLY

WARNING: THE RESIDUAL COVARIANCE MATRIX (THETA) IN GROUP CATHOLIC IS NOT
POSITIVE DEFINITE. THIS COULD INDICATE A NEGATIVE VARIANCE/RESIDUAL

VARIANCE FOR AN OBSERVED VARIABLE, A CORRELATION GREATER OR EQUAL TO ONE
BETWEEN TWO OBSERVED VARIABLES, OR A LINEAR DEPENDENCY AMONG MORE THAN TWO
OBSERVED VARIABLES. CHECK THE RESULTS SECTION FOR MORE INFORMATION.
PROBLEM INVOLVING VARIABLE RELIG14.

TESTS OF MODEL FIT

Chi-Square Test of Model Fit

Value	878.072*
Degrees of Freedom	281**
P-Value	0.0000

Chi-Square Contributions From Each Group

BAPTIST	256.519
CATHOLIC	190.194
JEWISH	180.688
LDS	250.672

* The chi-square value for MLM, MLMV, MLR, ULSMV, WLSM and WLSMV cannot be used
for chi-square difference tests. MLM, MLR and WLSM chi-square difference testing is described in the Mplus Technical Appendices at www.statmodel.com.
See chi-square difference testing in the index of the Mplus User's Guide.

** The degrees of freedom for MLMV, ULSMV and WLSMV are estimated according to
a formula given in the Mplus Technical Appendices at www.statmodel.com.
See degrees of freedom in the index of the Mplus User's Guide.

Chi-Square Test of Model Fit for the Baseline Model

Value	9308.845
Degrees of Freedom	114
P-Value	0.0000

CFI/TLI

CFI	0.935

TLI 0.974

Number of Free Parameters 786

RMSEA (Root Mean Square Error Of Approximation)

Estimate 0.108

WRMR (Weighted Root Mean Square Residual)

Value 2.344

MODEL RESULTS

	Estimate	S.E.	Two-Tailed Est./S.E.	P-Value
Group BAPTIST				
SCIACCEP BY				
ACSS01	1.000	0.000	999.000	999.000
ACSS02	1.006	0.052	19.432	0.000
ACSS03	0.609	0.075	8.104	0.000
ACSS04	0.643	0.059	10.916	0.000
ACSS05	0.810	0.056	14.430	0.000
ACSS06	0.982	0.049	19.847	0.000
ACSS07	0.690	0.055	12.611	0.000
ACSS08	1.174	0.052	22.587	0.000
ACSS09	1.018	0.053	19.312	0.000
ACSS10	1.041	0.042	24.826	0.000
ACSS11	1.120	0.045	25.021	0.000
ACSS12	0.994	0.044	22.565	0.000
RBELIEFS BY				
ACRS01	1.000	0.000	999.000	999.000
ACRS02	0.248	0.050	4.973	0.000
ACRS03	0.849	0.042	20.425	0.000
ACRS04	0.817	0.046	17.825	0.000
ACRS05	0.988	0.033	30.223	0.000
ACRS06	0.734	0.053	13.935	0.000
ACRS07	0.467	0.063	7.403	0.000
ACRS08	0.721	0.049	14.753	0.000
ACRS09	0.908	0.042	21.474	0.000
ACRS11	0.557	0.059	9.454	0.000

ACRS13	0.624	0.051	12.232	0.000
RPRACTIC BY				
RELIG07	1.000	0.000	999.000	999.000
RELIG05	1.028	0.050	20.659	0.000
RELIG08	0.958	0.066	14.519	0.000
RELIG04	0.985	0.061	16.045	0.000
RINFLUEN BY				
RELIG09	1.000	0.000	999.000	999.000
RELIG10	1.044	0.068	15.455	0.000
RELIG11	1.047	0.053	19.736	0.000
RELIG12	1.169	0.055	21.249	0.000
RELIG13	1.097	0.057	19.321	0.000
RHOPE BY				
RELIG14	1.000	0.000	999.000	999.000
RELIG15	0.207	0.050	4.172	0.000
RELIG16	0.830	0.072	11.466	0.000
RELIG17	0.636	0.064	9.900	0.000
RELIG18	0.236	0.058	4.053	0.000
SCIACCEP ON				
RBELIEFS	-0.602	0.068	-8.906	0.000
RPRACTIC	-0.160	0.052	-3.110	0.002
RINFLUEN	0.051	0.037	1.400	0.161
RHOPE	0.192	0.051	3.786	0.000
RBELIEFS ON				
RPRACTIC	0.275	0.075	3.667	0.000
RINFLUEN	0.269	0.066	4.065	0.000
RHOPE	0.468	0.067	7.034	0.000
RINFLUEN WITH				
RPRACTIC	0.409	0.048	8.509	0.000
RHOPE WITH				
RPRACTIC	0.285	0.065	4.356	0.000
RINFLUEN	0.435	0.063	6.917	0.000
Means				
RPRACTIC	0.000	0.000	999.000	999.000
RINFLUEN	0.000	0.000	999.000	999.000
RHOPE	0.000	0.000	999.000	999.000
Intercepts				

SCIACCEP	0.000	0.000	999.000	999.000
RBELIEFS	0.000	0.000	999.000	999.000

Thresholds

RELIG04$1	-0.134	0.088	-1.516	0.130
RELIG04$2	-0.048	0.079	-0.602	0.547
RELIG04$3	0.259	0.090	2.892	0.004
RELIG04$4	0.588	0.096	6.118	0.000
RELIG04$5	1.276	0.135	9.450	0.000
RELIG05$1	-0.048	0.082	-0.587	0.558
RELIG05$2	0.222	0.094	2.370	0.018
RELIG05$3	1.020	0.113	9.044	0.000
RELIG05$4	2.132	0.230	9.278	0.000
RELIG05$5	2.291	0.267	8.577	0.000
RELIG07$1	-0.145	0.092	-1.576	0.115
RELIG07$2	0.097	0.093	1.038	0.299
RELIG07$3	0.910	0.108	8.403	0.000
RELIG07$4	1.919	0.192	10.018	0.000
RELIG08$1	0.054	0.106	0.508	0.612
RELIG08$2	0.811	0.105	7.728	0.000
RELIG08$3	1.320	0.129	10.215	0.000
RELIG08$4	1.919	0.192	10.018	0.000
RELIG08$5	2.543	0.348	7.298	0.000
RELIG09$1	-0.459	0.083	-5.535	0.000
RELIG09$2	0.075	0.101	0.740	0.459
RELIG09$3	0.487	0.097	5.018	0.000
RELIG09$4	1.020	0.113	9.044	0.000
RELIG09$5	1.465	0.140	10.467	0.000
RELIG10$1	-0.441	0.084	-5.273	0.000
RELIG10$2	0.396	0.096	4.140	0.000
RELIG10$3	0.830	0.106	7.865	0.000
RELIG10$4	1.257	0.125	10.042	0.000
RELIG10$5	1.769	0.171	10.357	0.000
RELIG11$1	-0.764	0.093	-8.208	0.000
RELIG11$2	-0.411	0.096	-4.286	0.000
RELIG11$3	0.138	0.093	1.482	0.138
RELIG11$4	0.649	0.100	6.464	0.000
RELIG11$5	1.465	0.140	10.467	0.000
RELIG12$1	-0.830	0.100	-8.294	0.000
RELIG12$2	-0.471	0.097	-4.872	0.000
RELIG12$3	0.194	0.094	2.074	0.038
RELIG12$4	0.632	0.100	6.321	0.000
RELIG12$5	1.198	0.122	9.846	0.000
RELIG13$1	-1.411	0.133	-10.586	0.000
RELIG13$2	-0.975	0.111	-8.792	0.000
RELIG13$3	-0.471	0.097	-4.872	0.000

RELIG13$4	-0.069	0.093	-0.741	0.459
RELIG13$5	0.649	0.100	6.464	0.000
RELIG14$1	-2.607	0.239	-10.893	0.000
RELIG14$2	-2.278	0.216	-10.538	0.000
RELIG14$3	-1.551	0.147	-10.520	0.000
RELIG14$4	-0.830	0.106	-7.865	0.000
RELIG15$1	-1.164	0.193	-6.019	0.000
RELIG15$2	-0.683	0.101	-6.749	0.000
RELIG15$3	-0.426	0.096	-4.433	0.000
RELIG15$4	0.180	0.093	1.926	0.054
RELIG15$5	0.502	0.097	5.164	0.000
RELIG16$1	-2.446	0.250	-9.796	0.000
RELIG16$2	-2.015	0.207	-9.721	0.000
RELIG16$3	-1.092	0.116	-9.405	0.000
RELIG16$4	-0.293	0.094	-3.109	0.002
RELIG17$1	-1.854	0.161	-11.516	0.000
RELIG17$2	-1.507	0.143	-10.501	0.000
RELIG17$3	-1.092	0.116	-9.405	0.000
RELIG17$4	-0.456	0.096	-4.726	0.000
RELIG17$5	0.166	0.093	1.778	0.075
RELIG18$1	-1.351	0.267	-5.052	0.000
RELIG18$2	-1.354	0.132	-10.292	0.000
RELIG18$3	-0.953	0.110	-8.664	0.000
RELIG18$4	-0.441	0.096	-4.580	0.000
RELIG18$5	0.251	0.094	2.666	0.008
ACRS01$1	-1.947	0.152	-12.842	0.000
ACRS01$2	-1.387	0.129	-10.712	0.000
ACRS01$3	-0.773	0.104	-7.452	0.000
ACRS02$1	-0.784	0.149	-5.260	0.000
ACRS02$2	-0.953	0.110	-8.664	0.000
ACRS02$3	-0.683	0.101	-6.749	0.000
ACRS02$4	-0.265	0.094	-2.814	0.005
ACRS02$5	0.236	0.094	2.518	0.012
ACRS03$1	-1.692	0.111	-15.269	0.000
ACRS03$2	-1.320	0.129	-10.215	0.000
ACRS03$3	-1.044	0.114	-9.167	0.000
ACRS03$4	-0.683	0.101	-6.749	0.000
ACRS03$5	-0.308	0.095	-3.256	0.001
ACRS04$1	-2.166	0.169	-12.813	0.000
ACRS04$2	-1.707	0.163	-10.446	0.000
ACRS04$3	-1.507	0.143	-10.501	0.000
ACRS04$4	-0.953	0.110	-8.664	0.000
ACRS04$5	-0.396	0.096	-4.140	0.000
ACRS05$1	-2.156	0.163	-13.187	0.000
ACRS05$2	-1.507	0.143	-10.501	0.000
ACRS05$3	-1.288	0.127	-10.132	0.000

ACRS05$4	-0.869	0.107	-8.136	0.000
ACRS05$5	-0.411	0.096	-4.286	0.000
ACRS06$1	-1.614	0.120	-13.473	0.000
ACRS06$2	-1.354	0.132	-10.292	0.000
ACRS06$3	-0.997	0.112	-8.919	0.000
ACRS06$4	-0.502	0.097	-5.164	0.000
ACRS06$5	-0.152	0.093	-1.630	0.103
ACRS07$1	-0.750	0.096	-7.833	0.000
ACRS07$2	-0.279	0.094	-2.961	0.003
ACRS07$3	0.055	0.093	0.593	0.553
ACRS07$4	0.396	0.096	4.140	0.000
ACRS07$5	0.683	0.101	6.749	0.000
ACRS08$1	-1.496	0.116	-12.951	0.000
ACRS08$2	-1.020	0.113	-9.044	0.000
ACRS08$3	-0.649	0.100	-6.464	0.000
ACRS08$4	0.041	0.093	0.445	0.657
ACRS08$5	0.599	0.099	6.033	0.000
ACRS09$1	-1.917	0.133	-14.406	0.000
ACRS09$2	-1.465	0.140	-10.467	0.000
ACRS09$3	-1.144	0.119	-9.632	0.000
ACRS09$4	-0.754	0.103	-7.312	0.000
ACRS09$5	-0.194	0.094	-2.074	0.038
ACRS11$1	-1.284	0.113	-11.396	0.000
ACRS11$2	-0.830	0.106	-7.865	0.000
ACRS11$3	-0.487	0.097	-5.018	0.000
ACRS11$4	-0.110	0.093	-1.186	0.236
ACRS11$5	0.265	0.094	2.814	0.005
ACRS13$1	-0.843	0.087	-9.650	0.000
ACRS13$2	-0.194	0.094	-2.074	0.038
ACRS13$3	0.279	0.094	2.961	0.003
ACRS13$4	0.615	0.100	6.177	0.000
ACRS13$5	0.997	0.112	8.919	0.000
ACSS01$1	-0.335	0.077	-4.322	0.000
ACSS01$2	0.051	0.073	0.701	0.483
ACSS01$3	0.411	0.096	4.286	0.000
ACSS01$4	0.849	0.106	8.001	0.000
ACSS01$5	1.227	0.123	9.946	0.000
ACSS02$1	-0.630	0.087	-7.232	0.000
ACSS02$2	-0.208	0.094	-2.222	0.026
ACSS02$3	0.124	0.093	1.334	0.182
ACSS02$4	0.736	0.103	7.172	0.000
ACSS02$5	1.257	0.125	10.042	0.000
ACSS03$1	-1.372	0.150	-9.145	0.000
ACSS03$2	-1.551	0.147	-10.520	0.000
ACSS03$3	-1.118	0.117	-9.520	0.000
ACSS03$4	-0.487	0.097	-5.018	0.000

ACSS03$5	0.322	0.095	3.404	0.001
ACSS04$1	-0.941	0.103	-9.118	0.000
ACSS04$2	-0.518	0.098	-5.309	0.000
ACSS04$3	-0.055	0.093	-0.593	0.553
ACSS04$4	0.534	0.098	5.455	0.000
ACSS04$5	1.144	0.119	9.632	0.000
ACSS05$1	-0.838	0.090	-9.277	0.000
ACSS05$2	-0.534	0.098	-5.455	0.000
ACSS05$3	-0.041	0.093	-0.445	0.657
ACSS05$4	0.632	0.100	6.321	0.000
ACSS05$5	1.257	0.125	10.042	0.000
ACSS06$1	-0.956	0.101	-9.457	0.000
ACSS06$2	-0.649	0.100	-6.464	0.000
ACSS06$3	-0.322	0.095	-3.404	0.001
ACSS06$4	0.069	0.093	0.741	0.459
ACSS06$5	0.649	0.100	6.464	0.000
ACSS07$1	-1.116	0.106	-10.555	0.000
ACSS07$2	-0.666	0.101	-6.607	0.000
ACSS07$3	-0.194	0.094	-2.074	0.038
ACSS07$4	0.550	0.098	5.600	0.000
ACSS07$5	1.288	0.127	10.132	0.000
ACSS08$1	-0.326	0.085	-3.835	0.000
ACSS08$2	0.083	0.093	0.889	0.374
ACSS08$3	0.487	0.097	5.018	0.000
ACSS08$4	0.869	0.107	8.136	0.000
ACSS08$5	1.426	0.137	10.419	0.000
ACSS09$1	-1.018	0.104	-9.754	0.000
ACSS09$2	-0.736	0.103	-7.172	0.000
ACSS09$3	-0.441	0.096	-4.580	0.000
ACSS09$4	0.194	0.094	2.074	0.038
ACSS09$5	0.811	0.105	7.728	0.000
ACSS10$1	-0.882	0.098	-9.040	0.000
ACSS10$2	-0.502	0.097	-5.164	0.000
ACSS10$3	0.083	0.093	0.889	0.374
ACSS10$4	0.666	0.101	6.607	0.000
ACSS10$5	1.426	0.137	10.419	0.000
ACSS11$1	-0.203	0.080	-2.540	0.011
ACSS11$2	0.152	0.093	1.630	0.103
ACSS11$3	0.411	0.096	4.286	0.000
ACSS11$4	0.718	0.102	7.032	0.000
ACSS11$5	1.354	0.132	10.292	0.000
ACSS12$1	-0.723	0.093	-7.751	0.000
ACSS12$2	-0.426	0.096	-4.433	0.000
ACSS12$3	-0.138	0.093	-1.482	0.138
ACSS12$4	0.487	0.097	5.018	0.000
ACSS12$5	1.171	0.120	9.741	0.000

Variances

RPRACTIC	0.739	0.055	13.426	0.000
RINFLUEN	0.634	0.055	11.447	0.000
RHOPE	0.997	0.104	9.605	0.000

Residual Variances

SCIACCEP	0.355	0.046	7.636	0.000
RBELIEFS	0.343	0.065	5.257	0.000

Scales

RELIG04	1.000	0.000	999.000	999.000
RELIG05	1.000	0.000	999.000	999.000
RELIG07	1.000	0.000	999.000	999.000
RELIG08	1.000	0.000	999.000	999.000
RELIG09	1.000	0.000	999.000	999.000
RELIG10	1.000	0.000	999.000	999.000
RELIG11	1.000	0.000	999.000	999.000
RELIG12	1.000	0.000	999.000	999.000
RELIG13	1.000	0.000	999.000	999.000
RELIG14	1.000	0.000	999.000	999.000
RELIG15	1.000	0.000	999.000	999.000
RELIG16	1.000	0.000	999.000	999.000
RELIG17	1.000	0.000	999.000	999.000
RELIG18	1.000	0.000	999.000	999.000
ACRS01	1.000	0.000	999.000	999.000
ACRS02	1.000	0.000	999.000	999.000
ACRS03	1.000	0.000	999.000	999.000
ACRS04	1.000	0.000	999.000	999.000
ACRS05	1.000	0.000	999.000	999.000
ACRS06	1.000	0.000	999.000	999.000
ACRS07	1.000	0.000	999.000	999.000
ACRS08	1.000	0.000	999.000	999.000
ACRS09	1.000	0.000	999.000	999.000
ACRS11	1.000	0.000	999.000	999.000
ACRS13	1.000	0.000	999.000	999.000
ACSS01	1.000	0.000	999.000	999.000
ACSS02	1.000	0.000	999.000	999.000
ACSS03	1.000	0.000	999.000	999.000
ACSS04	1.000	0.000	999.000	999.000
ACSS05	1.000	0.000	999.000	999.000
ACSS06	1.000	0.000	999.000	999.000
ACSS07	1.000	0.000	999.000	999.000
ACSS08	1.000	0.000	999.000	999.000
ACSS09	1.000	0.000	999.000	999.000
ACSS10	1.000	0.000	999.000	999.000

ACSS11	1.000	0.000	999.000	999.000
ACSS12	1.000	0.000	999.000	999.000

Group CATHOLIC

SCIACCEP BY

ACSS01	1.000	0.000	999.000	999.000
ACSS02	1.006	0.052	19.432	0.000
ACSS03	0.609	0.075	8.104	0.000
ACSS04	0.643	0.059	10.916	0.000
ACSS05	0.810	0.056	14.430	0.000
ACSS06	0.982	0.049	19.847	0.000
ACSS07	0.690	0.055	12.611	0.000
ACSS08	1.174	0.052	22.587	0.000
ACSS09	1.018	0.053	19.312	0.000
ACSS10	1.041	0.042	24.826	0.000
ACSS11	1.120	0.045	25.021	0.000
ACSS12	0.994	0.044	22.565	0.000

RBELIEFS BY

ACRS01	1.000	0.000	999.000	999.000
ACRS02	0.248	0.050	4.973	0.000
ACRS03	0.849	0.042	20.425	0.000
ACRS04	0.817	0.046	17.825	0.000
ACRS05	0.988	0.033	30.223	0.000
ACRS06	0.734	0.053	13.935	0.000
ACRS07	0.467	0.063	7.403	0.000
ACRS08	0.721	0.049	14.753	0.000
ACRS09	0.908	0.042	21.474	0.000
ACRS11	0.557	0.059	9.454	0.000
ACRS13	0.624	0.051	12.232	0.000

RPRACTIC BY

RELIG07	1.000	0.000	999.000	999.000
RELIG05	1.028	0.050	20.659	0.000
RELIG08	0.958	0.066	14.519	0.000
RELIG04	0.985	0.061	16.045	0.000

RINFLUEN BY

RELIG09	1.000	0.000	999.000	999.000
RELIG10	1.044	0.068	15.455	0.000
RELIG11	1.047	0.053	19.736	0.000
RELIG12	1.169	0.055	21.249	0.000
RELIG13	1.097	0.057	19.321	0.000

RHOPE BY

RELIG14	1.000	0.000	999.000	999.000
RELIG15	0.207	0.050	4.172	0.000
RELIG16	0.830	0.072	11.466	0.000
RELIG17	0.636	0.064	9.900	0.000
RELIG18	0.236	0.058	4.053	0.000
SCIACCEP ON				
RBELIEFS	-0.602	0.068	-8.906	0.000
RPRACTIC	-0.160	0.052	-3.110	0.002
RINFLUEN	0.051	0.037	1.400	0.161
RHOPE	0.192	0.051	3.786	0.000
RBELIEFS ON				
RPRACTIC	-0.084	0.081	-1.036	0.300
RINFLUEN	0.269	0.066	4.065	0.000
RHOPE	0.468	0.067	7.034	0.000
RINFLUEN WITH				
RPRACTIC	0.159	0.128	1.245	0.213
RHOPE WITH				
RPRACTIC	0.128	0.104	1.226	0.220
RINFLUEN	0.471	0.179	2.631	0.009
Means				
RPRACTIC	-0.164	0.108	-1.521	0.128
RINFLUEN	-0.383	0.111	-3.449	0.001
RHOPE	-0.039	0.579	-0.067	0.947
Intercepts				
SCIACCEP	0.279	0.197	1.416	0.157
RBELIEFS	-0.715	0.190	-3.759	0.000
Thresholds				
RELIG04$1	-0.134	0.088	-1.516	0.130
RELIG04$2	-0.048	0.079	-0.602	0.547
RELIG04$3	0.127	0.165	0.772	0.440
RELIG04$4	0.253	0.250	1.012	0.312
RELIG04$5	0.487	0.415	1.173	0.241
RELIG05$1	-0.048	0.082	-0.587	0.558
RELIG05$2	-0.011	0.093	-0.116	0.908
RELIG05$3	0.264	0.256	1.034	0.301
RELIG05$4	0.426	0.374	1.140	0.254
RELIG05$5	0.508	0.427	1.190	0.234
RELIG07$1	-0.145	0.092	-1.576	0.115
RELIG07$2	-0.081	0.081	-0.999	0.318

RELIG07$3	0.238	0.237	1.005	0.315
RELIG07$4	0.469	0.402	1.166	0.243
RELIG08$1	0.054	0.106	0.508	0.612
RELIG08$2	0.134	0.165	0.815	0.415
RELIG08$3	0.301	0.280	1.076	0.282
RELIG08$4	0.473	0.409	1.155	0.248
RELIG08$5	0.638	0.533	1.198	0.231
RELIG09$1	-0.459	0.083	-5.535	0.000
RELIG09$2	0.075	0.101	0.740	0.459
RELIG09$3	0.716	0.271	2.642	0.008
RELIG09$4	1.287	0.398	3.232	0.001
RELIG09$5	2.084	0.616	3.383	0.001
RELIG10$1	-0.441	0.084	-5.273	0.000
RELIG10$2	0.297	0.212	1.402	0.161
RELIG10$3	0.762	0.302	2.518	0.012
RELIG10$4	1.355	0.439	3.085	0.002
RELIG10$5	2.084	0.630	3.310	0.001
RELIG11$1	-0.764	0.093	-8.208	0.000
RELIG11$2	-0.089	0.139	-0.644	0.519
RELIG11$3	0.343	0.206	1.667	0.096
RELIG11$4	0.814	0.298	2.730	0.006
RELIG11$5	2.031	0.604	3.363	0.001
RELIG12$1	-0.830	0.100	-8.294	0.000
RELIG12$2	-0.236	0.144	-1.644	0.100
RELIG12$3	0.482	0.257	1.874	0.061
RELIG12$4	1.028	0.358	2.876	0.004
RELIG12$5	2.242	0.638	3.514	0.000
RELIG13$1	-1.411	0.133	-10.586	0.000
RELIG13$2	-0.970	0.147	-6.620	0.000
RELIG13$3	-0.213	0.158	-1.349	0.177
RELIG13$4	0.499	0.271	1.845	0.065
RELIG13$5	1.409	0.451	3.122	0.002
RELIG14$1	-2.607	0.239	-10.893	0.000
RELIG14$2	-2.278	0.216	-10.538	0.000
RELIG14$3	-1.168	0.369	-3.167	0.002
RELIG14$4	-0.251	0.539	-0.465	0.642
RELIG15$1	-1.164	0.193	-6.019	0.000
RELIG15$2	-0.799	0.181	-4.417	0.000
RELIG15$3	-0.505	0.136	-3.725	0.000
RELIG15$4	-0.113	0.123	-0.922	0.356
RELIG15$5	0.429	0.207	2.077	0.038
RELIG16$1	-2.446	0.250	-9.796	0.000
RELIG16$2	-2.056	0.306	-6.710	0.000
RELIG16$3	-1.077	0.329	-3.277	0.001
RELIG16$4	0.046	0.498	0.092	0.926
RELIG17$1	-1.854	0.161	-11.516	0.000

RELIG17$2	-1.484	0.204	-7.276	0.000
RELIG17$3	-0.943	0.231	-4.087	0.000
RELIG17$4	-0.150	0.346	-0.432	0.666
RELIG17$5	0.580	0.486	1.193	0.233
RELIG18$1	-1.351	0.267	-5.052	0.000
RELIG18$2	-1.203	0.312	-3.858	0.000
RELIG18$3	-0.782	0.217	-3.606	0.000
RELIG18$4	-0.274	0.143	-1.920	0.055
RELIG18$5	0.343	0.204	1.680	0.093
ACRS01$1	-1.947	0.152	-12.842	0.000
ACRS01$2	-1.387	0.129	-10.712	0.000
ACRS01$3	-0.648	0.213	-3.037	0.002
ACRS02$1	-0.784	0.149	-5.260	0.000
ACRS02$2	-0.580	0.124	-4.665	0.000
ACRS02$3	-0.340	0.084	-4.037	0.000
ACRS02$4	-0.061	0.075	-0.820	0.412
ACRS02$5	0.229	0.122	1.871	0.061
ACRS03$1	-1.692	0.111	-15.269	0.000
ACRS03$2	-1.283	0.127	-10.109	0.000
ACRS03$3	-0.837	0.150	-5.571	0.000
ACRS03$4	-0.388	0.194	-1.996	0.046
ACRS03$5	0.043	0.251	0.171	0.864
ACRS04$1	-2.166	0.169	-12.813	0.000
ACRS04$2	-1.742	0.161	-10.825	0.000
ACRS04$3	-1.327	0.138	-9.631	0.000
ACRS04$4	-0.723	0.156	-4.632	0.000
ACRS04$5	-0.201	0.211	-0.955	0.339
ACRS05$1	-2.156	0.163	-13.187	0.000
ACRS05$2	-1.654	0.163	-10.164	0.000
ACRS05$3	-1.179	0.166	-7.098	0.000
ACRS05$4	-0.707	0.201	-3.509	0.000
ACRS05$5	-0.281	0.250	-1.127	0.260
ACRS06$1	-1.614	0.120	-13.473	0.000
ACRS06$2	-1.125	0.128	-8.803	0.000
ACRS06$3	-0.785	0.134	-5.871	0.000
ACRS06$4	-0.294	0.182	-1.614	0.106
ACRS06$5	0.193	0.254	0.760	0.447
ACRS07$1	-0.750	0.096	-7.833	0.000
ACRS07$2	-0.430	0.114	-3.761	0.000
ACRS07$3	-0.102	0.142	-0.721	0.471
ACRS07$4	0.294	0.206	1.432	0.152
ACRS07$5	0.749	0.298	2.516	0.012
ACRS08$1	-1.496	0.116	-12.951	0.000
ACRS08$2	-0.864	0.141	-6.110	0.000
ACRS08$3	-0.290	0.185	-1.562	0.118
ACRS08$4	0.403	0.278	1.449	0.147

ACRS08$5	1.183	0.411	2.879	0.004
ACRS09$1	-1.917	0.133	-14.406	0.000
ACRS09$2	-1.566	0.149	-10.497	0.000
ACRS09$3	-1.121	0.156	-7.187	0.000
ACRS09$4	-0.577	0.195	-2.957	0.003
ACRS09$5	-0.024	0.263	-0.092	0.927
ACRS11$1	-1.284	0.113	-11.396	0.000
ACRS11$2	-0.883	0.116	-7.603	0.000
ACRS11$3	-0.446	0.124	-3.596	0.000
ACRS11$4	-0.020	0.167	-0.120	0.905
ACRS11$5	0.336	0.229	1.466	0.143
ACRS13$1	-0.843	0.087	-9.650	0.000
ACRS13$2	-0.295	0.155	-1.909	0.056
ACRS13$3	0.265	0.242	1.093	0.274
ACRS13$4	0.585	0.294	1.987	0.047
ACRS13$5	1.011	0.385	2.625	0.009
ACSS01$1	-0.335	0.077	-4.322	0.000
ACSS01$2	0.051	0.073	0.701	0.483
ACSS01$3	0.358	0.141	2.543	0.011
ACSS01$4	0.944	0.215	4.399	0.000
ACSS01$5	1.521	0.299	5.081	0.000
ACSS02$1	-0.630	0.087	-7.232	0.000
ACSS02$2	-0.268	0.124	-2.151	0.031
ACSS02$3	0.187	0.147	1.272	0.203
ACSS02$4	0.881	0.216	4.078	0.000
ACSS02$5	1.501	0.296	5.065	0.000
ACSS03$1	-1.372	0.150	-9.145	0.000
ACSS03$2	-0.856	0.183	-4.690	0.000
ACSS03$3	-0.634	0.149	-4.264	0.000
ACSS03$4	-0.064	0.103	-0.616	0.538
ACSS03$5	0.624	0.163	3.838	0.000
ACSS04$1	-0.941	0.103	-9.118	0.000
ACSS04$2	-0.358	0.112	-3.203	0.001
ACSS04$3	0.018	0.100	0.178	0.859
ACSS04$4	0.687	0.160	4.301	0.000
ACSS04$5	1.211	0.236	5.142	0.000
ACSS05$1	-0.838	0.090	-9.277	0.000
ACSS05$2	-0.300	0.097	-3.085	0.002
ACSS05$3	0.084	0.108	0.783	0.434
ACSS05$4	0.637	0.159	4.017	0.000
ACSS05$5	1.143	0.222	5.139	0.000
ACSS06$1	-0.956	0.101	-9.457	0.000
ACSS06$2	-0.855	0.191	-4.476	0.000
ACSS06$3	-0.404	0.159	-2.537	0.011
ACSS06$4	0.363	0.173	2.097	0.036
ACSS06$5	1.141	0.243	4.693	0.000

ACSS07$1	-1.116	0.106	-10.555	0.000
ACSS07$2	-0.670	0.133	-5.029	0.000
ACSS07$3	-0.164	0.108	-1.523	0.128
ACSS07$4	0.613	0.158	3.881	0.000
ACSS07$5	1.265	0.245	5.168	0.000
ACSS08$1	-0.326	0.085	-3.835	0.000
ACSS08$2	-0.116	0.130	-0.891	0.373
ACSS08$3	0.242	0.160	1.508	0.131
ACSS08$4	0.780	0.217	3.588	0.000
ACSS08$5	1.760	0.344	5.109	0.000
ACSS09$1	-1.018	0.104	-9.754	0.000
ACSS09$2	-0.888	0.185	-4.791	0.000
ACSS09$3	-0.401	0.159	-2.521	0.012
ACSS09$4	0.430	0.178	2.416	0.016
ACSS09$5	1.114	0.248	4.486	0.000
ACSS10$1	-0.882	0.098	-9.040	0.000
ACSS10$2	-0.399	0.128	-3.126	0.002
ACSS10$3	-0.068	0.135	-0.505	0.613
ACSS10$4	0.681	0.194	3.501	0.000
ACSS10$5	1.601	0.305	5.247	0.000
ACSS11$1	-0.203	0.080	-2.540	0.011
ACSS11$2	-0.075	0.125	-0.599	0.549
ACSS11$3	0.347	0.156	2.228	0.026
ACSS11$4	0.853	0.217	3.939	0.000
ACSS11$5	1.447	0.298	4.850	0.000
ACSS12$1	-0.723	0.093	-7.751	0.000
ACSS12$2	-0.443	0.116	-3.822	0.000
ACSS12$3	0.077	0.137	0.558	0.577
ACSS12$4	0.781	0.196	3.977	0.000
ACSS12$5	1.461	0.283	5.161	0.000

Variances

RPRACTIC	0.066	0.095	0.691	0.489
RINFLUEN	0.821	0.345	2.376	0.017
RHOPE	1.965	0.911	2.157	0.031

Residual Variances

SCIACCEP	0.392	0.126	3.113	0.002
RBELIEFS	0.491	0.151	3.253	0.001

Scales

RELIG04	3.536	2.573	1.374	0.169
RELIG05	3.387	2.438	1.389	0.165
RELIG07	3.369	2.435	1.384	0.166
RELIG08	3.199	2.328	1.374	0.169
RELIG09	0.929	0.194	4.785	0.000

RELIG10	0.859	0.184	4.677	0.000
RELIG11	0.942	0.193	4.877	0.000
RELIG12	0.852	0.175	4.871	0.000
RELIG13	0.801	0.163	4.912	0.000
RELIG14	0.718	0.173	4.147	0.000
RELIG15	1.445	0.345	4.195	0.000
RELIG16	0.705	0.156	4.522	0.000
RELIG17	0.882	0.193	4.584	0.000
RELIG18	1.382	0.375	3.682	0.000
ACRS01	0.873	0.129	6.747	0.000
ACRS02	2.055	0.493	4.170	0.000
ACRS03	0.994	0.144	6.919	0.000
ACRS04	1.069	0.159	6.713	0.000
ACRS05	0.918	0.135	6.790	0.000
ACRS06	0.994	0.157	6.339	0.000
ACRS07	1.195	0.248	4.818	0.000
ACRS08	0.873	0.135	6.484	0.000
ACRS09	0.898	0.130	6.935	0.000
ACRS11	1.147	0.195	5.880	0.000
ACRS13	1.017	0.175	5.806	0.000
ACSS01	1.136	0.163	6.957	0.000
ACSS02	1.069	0.150	7.122	0.000
ACSS03	1.447	0.236	6.122	0.000
ACSS04	1.247	0.189	6.611	0.000
ACSS05	1.357	0.185	7.350	0.000
ACSS06	0.961	0.133	7.215	0.000
ACSS07	1.217	0.176	6.931	0.000
ACSS08	0.974	0.137	7.101	0.000
ACSS09	0.985	0.132	7.486	0.000
ACSS10	0.995	0.135	7.359	0.000
ACSS11	1.060	0.147	7.186	0.000
ACSS12	1.117	0.152	7.325	0.000

Group JEWISH

SCIACCEP BY

ACSS01	1.000	0.000	999.000	999.000
ACSS02	1.006	0.052	19.432	0.000
ACSS03	0.609	0.075	8.104	0.000
ACSS04	0.643	0.059	10.916	0.000
ACSS05	0.810	0.056	14.430	0.000
ACSS06	0.982	0.049	19.847	0.000
ACSS07	0.690	0.055	12.611	0.000
ACSS08	1.174	0.052	22.587	0.000
ACSS09	1.018	0.053	19.312	0.000
ACSS10	1.041	0.042	24.826	0.000

ACSS11	1.120	0.045	25.021	0.000
ACSS12	0.994	0.044	22.565	0.000
RBELIEFS BY				
ACRS01	1.000	0.000	999.000	999.000
ACRS02	0.248	0.050	4.973	0.000
ACRS03	0.849	0.042	20.425	0.000
ACRS04	0.817	0.046	17.825	0.000
ACRS05	0.988	0.033	30.223	0.000
ACRS06	0.734	0.053	13.935	0.000
ACRS07	0.467	0.063	7.403	0.000
ACRS08	0.721	0.049	14.753	0.000
ACRS09	0.908	0.042	21.474	0.000
ACRS11	0.557	0.059	9.454	0.000
ACRS13	0.624	0.051	12.232	0.000
RPRACTIC BY				
RELIG07	1.000	0.000	999.000	999.000
RELIG05	1.028	0.050	20.659	0.000
RELIG08	0.958	0.066	14.519	0.000
RELIG04	0.985	0.061	16.045	0.000
RINFLUEN BY				
RELIG09	1.000	0.000	999.000	999.000
RELIG10	1.044	0.068	15.455	0.000
RELIG11	1.047	0.053	19.736	0.000
RELIG12	1.169	0.055	21.249	0.000
RELIG13	1.097	0.057	19.321	0.000
RHOPE BY				
RELIG14	1.000	0.000	999.000	999.000
RELIG15	0.207	0.050	4.172	0.000
RELIG16	0.830	0.072	11.466	0.000
RELIG17	0.636	0.064	9.900	0.000
RELIG18	0.236	0.058	4.053	0.000
SCIACCEP ON				
RBELIEFS	-0.602	0.068	-8.906	0.000
RPRACTIC	-0.160	0.052	-3.110	0.002
RINFLUEN	0.051	0.037	1.400	0.161
RHOPE	0.192	0.051	3.786	0.000
RBELIEFS ON				
RPRACTIC	-0.084	0.081	-1.036	0.300
RINFLUEN	0.269	0.066	4.065	0.000
RHOPE	0.970	0.118	8.227	0.000

RINFLUEN WITH				
RPRACTIC	1.395	0.494	2.825	0.005
RHOPE WITH				
RPRACTIC	0.940	0.322	2.923	0.003
RINFLUEN	0.647	0.199	3.242	0.001
Means				
RPRACTIC	-1.113	0.363	-3.066	0.002
RINFLUEN	-0.555	0.119	-4.653	0.000
RHOPE	-1.852	0.229	-8.075	0.000
Intercepts				
SCIACCEP	0.000	0.000	999.000	999.000
RBELIEFS	0.000	0.000	999.000	999.000
Thresholds				
RELIG04$1	-0.134	0.088	-1.516	0.130
RELIG04$2	-0.048	0.079	-0.602	0.547
RELIG04$3	0.259	0.090	2.892	0.004
RELIG04$4	0.588	0.096	6.118	0.000
RELIG04$5	1.276	0.135	9.450	0.000
RELIG05$1	-0.048	0.082	-0.587	0.558
RELIG05$2	0.510	0.187	2.725	0.006
RELIG05$3	1.167	0.334	3.496	0.000
RELIG05$4	1.592	0.460	3.458	0.001
RELIG05$5	2.007	0.583	3.440	0.001
RELIG07$1	-0.145	0.092	-1.576	0.115
RELIG07$2	0.126	0.127	0.995	0.320
RELIG07$3	1.140	0.324	3.514	0.000
RELIG07$4	1.736	0.497	3.493	0.000
RELIG08$1	0.054	0.106	0.508	0.612
RELIG08$2	0.844	0.296	2.850	0.004
RELIG08$3	1.509	0.466	3.236	0.001
RELIG08$4	2.174	0.625	3.477	0.001
RELIG08$5	2.696	0.769	3.507	0.000
RELIG09$1	-0.459	0.083	-5.535	0.000
RELIG09$2	0.075	0.101	0.740	0.459
RELIG09$3	0.643	0.233	2.759	0.006
RELIG09$4	0.860	0.281	3.058	0.002
RELIG09$5	1.310	0.382	3.430	0.001
RELIG10$1	-0.441	0.084	-5.273	0.000
RELIG10$2	-0.505	0.111	-4.533	0.000
RELIG10$3	0.019	0.157	0.120	0.905
RELIG10$4	0.423	0.216	1.957	0.050

RELIG10$5	1.111	0.341	3.258	0.001
RELIG11$1	-0.764	0.093	-8.208	0.000
RELIG11$2	-0.123	0.142	-0.868	0.386
RELIG11$3	0.502	0.223	2.252	0.024
RELIG11$4	0.996	0.309	3.219	0.001
RELIG11$5	1.600	0.433	3.692	0.000
RELIG12$1	-0.830	0.100	-8.294	0.000
RELIG12$2	-0.162	0.152	-1.064	0.287
RELIG12$3	0.530	0.249	2.130	0.033
RELIG12$4	1.110	0.350	3.175	0.001
RELIG12$5	1.749	0.473	3.696	0.000
RELIG13$1	-1.411	0.133	-10.586	0.000
RELIG13$2	-0.629	0.124	-5.080	0.000
RELIG13$3	0.102	0.185	0.552	0.581
RELIG13$4	0.760	0.289	2.631	0.009
RELIG13$5	1.464	0.424	3.455	0.001
RELIG14$1	-2.607	0.239	-10.893	0.000
RELIG14$2	-2.278	0.216	-10.538	0.000
RELIG14$3	-1.647	0.227	-7.269	0.000
RELIG14$4	-1.145	0.251	-4.561	0.000
RELIG15$1	-1.164	0.193	-6.019	0.000
RELIG15$2	-0.886	0.175	-5.073	0.000
RELIG15$3	-0.601	0.126	-4.779	0.000
RELIG15$4	-0.262	0.096	-2.715	0.007
RELIG15$5	0.052	0.120	0.437	0.662
RELIG16$1	-2.446	0.250	-9.796	0.000
RELIG16$2	-2.087	0.236	-8.852	0.000
RELIG16$3	-1.271	0.210	-6.062	0.000
RELIG16$4	-0.740	0.224	-3.307	0.001
RELIG17$1	-1.854	0.161	-11.516	0.000
RELIG17$2	-1.358	0.144	-9.426	0.000
RELIG17$3	-1.018	0.145	-7.044	0.000
RELIG17$4	-0.640	0.162	-3.946	0.000
RELIG17$5	-0.270	0.190	-1.418	0.156
RELIG18$1	-1.351	0.267	-5.052	0.000
RELIG18$2	-1.046	0.228	-4.588	0.000
RELIG18$3	-0.834	0.183	-4.547	0.000
RELIG18$4	-0.357	0.103	-3.466	0.001
RELIG18$5	-0.019	0.099	-0.196	0.844
ACRS01$1	-1.947	0.152	-12.842	0.000
ACRS01$2	-1.387	0.129	-10.712	0.000
ACRS01$3	-0.764	0.206	-3.716	0.000
ACRS02$1	-0.784	0.149	-5.260	0.000
ACRS02$2	-0.649	0.134	-4.846	0.000
ACRS02$3	-0.447	0.096	-4.660	0.000
ACRS02$4	-0.243	0.072	-3.354	0.001

ACRS02$5	0.048	0.092	0.522	0.602
ACRS03$1	-1.692	0.111	-15.269	0.000
ACRS03$2	-1.399	0.127	-11.052	0.000
ACRS03$3	-1.105	0.137	-8.058	0.000
ACRS03$4	-0.711	0.165	-4.312	0.000
ACRS03$5	-0.429	0.191	-2.242	0.025
ACRS04$1	-2.166	0.169	-12.813	0.000
ACRS04$2	-1.930	0.177	-10.933	0.000
ACRS04$3	-1.578	0.153	-10.305	0.000
ACRS04$4	-1.079	0.146	-7.385	0.000
ACRS04$5	-0.500	0.185	-2.712	0.007
ACRS05$1	-2.156	0.163	-13.187	0.000
ACRS05$2	-1.707	0.159	-10.749	0.000
ACRS05$3	-1.308	0.165	-7.940	0.000
ACRS05$4	-0.959	0.184	-5.224	0.000
ACRS05$5	-0.582	0.215	-2.702	0.007
ACRS06$1	-1.614	0.120	-13.473	0.000
ACRS06$2	-1.010	0.124	-8.173	0.000
ACRS06$3	-0.754	0.133	-5.673	0.000
ACRS06$4	-0.534	0.150	-3.559	0.000
ACRS06$5	-0.098	0.193	-0.509	0.611
ACRS07$1	-0.750	0.096	-7.833	0.000
ACRS07$2	-0.554	0.118	-4.699	0.000
ACRS07$3	-0.348	0.130	-2.682	0.007
ACRS07$4	-0.099	0.161	-0.617	0.537
ACRS07$5	0.233	0.214	1.092	0.275
ACRS08$1	-1.496	0.116	-12.951	0.000
ACRS08$2	-0.703	0.162	-4.334	0.000
ACRS08$3	-0.099	0.245	-0.405	0.685
ACRS08$4	0.272	0.303	0.897	0.370
ACRS08$5	0.827	0.405	2.042	0.041
ACRS09$1	-1.917	0.133	-14.406	0.000
ACRS09$2	-1.577	0.142	-11.109	0.000
ACRS09$3	-1.364	0.145	-9.409	0.000
ACRS09$4	-0.899	0.168	-5.356	0.000
ACRS09$5	-0.374	0.214	-1.748	0.080
ACRS11$1	-1.284	0.113	-11.396	0.000
ACRS11$2	-0.819	0.105	-7.782	0.000
ACRS11$3	-0.508	0.117	-4.324	0.000
ACRS11$4	-0.288	0.146	-1.978	0.048
ACRS11$5	0.144	0.203	0.710	0.478
ACRS13$1	-0.843	0.087	-9.650	0.000
ACRS13$2	-0.333	0.151	-2.210	0.027
ACRS13$3	0.043	0.193	0.225	0.822
ACRS13$4	0.425	0.230	1.849	0.064
ACRS13$5	0.540	0.258	2.091	0.036

ACSS01$1	-0.335	0.077	-4.322	0.000
ACSS01$2	0.051	0.073	0.701	0.483
ACSS01$3	0.009	0.109	0.079	0.937
ACSS01$4	0.619	0.118	5.262	0.000
ACSS01$5	1.494	0.177	8.430	0.000
ACSS02$1	-0.630	0.087	-7.232	0.000
ACSS02$2	-0.590	0.144	-4.093	0.000
ACSS02$3	-0.221	0.136	-1.627	0.104
ACSS02$4	0.525	0.131	4.011	0.000
ACSS02$5	1.676	0.206	8.120	0.000
ACSS03$1	-1.372	0.150	-9.145	0.000
ACSS03$2	-0.826	0.164	-5.025	0.000
ACSS03$3	-0.699	0.148	-4.717	0.000
ACSS03$4	-0.303	0.113	-2.685	0.007
ACSS03$5	0.450	0.101	4.463	0.000
ACSS04$1	-0.941	0.103	-9.118	0.000
ACSS04$2	-0.654	0.163	-4.022	0.000
ACSS04$3	-0.104	0.121	-0.854	0.393
ACSS04$4	0.665	0.129	5.148	0.000
ACSS04$5	1.414	0.204	6.925	0.000
ACSS05$1	-0.838	0.090	-9.277	0.000
ACSS05$2	-0.647	0.132	-4.890	0.000
ACSS05$3	-0.285	0.108	-2.637	0.008
ACSS05$4	0.153	0.101	1.517	0.129
ACSS05$5	0.934	0.126	7.400	0.000
ACSS06$1	-0.956	0.101	-9.457	0.000
ACSS06$2	-0.468	0.124	-3.774	0.000
ACSS06$3	-0.181	0.121	-1.503	0.133
ACSS06$4	0.203	0.115	1.763	0.078
ACSS06$5	0.863	0.127	6.808	0.000
ACSS07$1	-1.116	0.106	-10.555	0.000
ACSS07$2	-0.706	0.137	-5.163	0.000
ACSS07$3	-0.362	0.122	-2.962	0.003
ACSS07$4	0.242	0.098	2.483	0.013
ACSS07$5	1.101	0.151	7.312	0.000
ACSS08$1	-0.326	0.085	-3.835	0.000
ACSS08$2	-0.339	0.122	-2.777	0.005
ACSS08$3	-0.099	0.121	-0.815	0.415
ACSS08$4	0.550	0.126	4.382	0.000
ACSS08$5	1.355	0.164	8.256	0.000
ACSS09$1	-1.018	0.104	-9.754	0.000
ACSS09$2	-0.721	0.123	-5.840	0.000
ACSS09$3	-0.547	0.122	-4.493	0.000
ACSS09$4	-0.009	0.120	-0.074	0.941
ACSS09$5	0.760	0.120	6.343	0.000
ACSS10$1	-0.882	0.098	-9.040	0.000

ACSS10$2	-0.694	0.142	-4.880	0.000
ACSS10$3	-0.258	0.139	-1.848	0.065
ACSS10$4	0.400	0.132	3.035	0.002
ACSS10$5	1.362	0.175	7.792	0.000
ACSS11$1	-0.203	0.080	-2.540	0.011
ACSS11$2	-0.342	0.121	-2.819	0.005
ACSS11$3	-0.135	0.113	-1.192	0.233
ACSS11$4	0.350	0.115	3.046	0.002
ACSS11$5	1.209	0.149	8.131	0.000
ACSS12$1	-0.723	0.093	-7.751	0.000
ACSS12$2	-0.641	0.145	-4.417	0.000
ACSS12$3	-0.254	0.127	-2.004	0.045
ACSS12$4	0.626	0.122	5.128	0.000
ACSS12$5	1.460	0.174	8.379	0.000

Variances

RPRACTIC	2.499	1.359	1.838	0.066
RINFLUEN	1.253	0.500	2.505	0.012
RHOPE	0.867	0.280	3.093	0.002

Residual Variances

SCIACCEP	0.410	0.106	3.855	0.000
RBELIEFS	0.477	0.149	3.200	0.001

Scales

RELIG04	0.641	0.165	3.890	0.000
RELIG05	0.580	0.159	3.647	0.000
RELIG07	0.595	0.162	3.683	0.000
RELIG08	0.564	0.157	3.588	0.000
RELIG09	0.879	0.175	5.029	0.000
RELIG10	0.754	0.149	5.045	0.000
RELIG11	0.751	0.145	5.165	0.000
RELIG12	0.707	0.138	5.143	0.000
RELIG13	0.701	0.132	5.323	0.000
RELIG14	0.968	0.157	6.170	0.000
RELIG15	1.866	0.421	4.437	0.000
RELIG16	1.022	0.159	6.419	0.000
RELIG17	1.338	0.210	6.382	0.000
RELIG18	2.147	0.501	4.282	0.000
ACRS01	0.730	0.115	6.340	0.000
ACRS02	2.223	0.541	4.110	0.000
ACRS03	0.901	0.140	6.428	0.000
ACRS04	0.863	0.136	6.365	0.000
ACRS05	0.806	0.130	6.210	0.000
ACRS06	0.986	0.157	6.294	0.000
ACRS07	1.253	0.259	4.840	0.000

ACRS08	0.813	0.136	5.969	0.000
ACRS09	0.806	0.125	6.460	0.000
ACRS11	1.202	0.208	5.769	0.000
ACRS13	1.037	0.165	6.274	0.000
ACSS01	0.881	0.096	9.207	0.000
ACSS02	0.807	0.091	8.851	0.000
ACSS03	1.229	0.174	7.081	0.000
ACSS04	0.891	0.119	7.502	0.000
ACSS05	1.080	0.122	8.824	0.000
ACSS06	0.914	0.100	9.133	0.000
ACSS07	1.090	0.128	8.511	0.000
ACSS08	0.842	0.096	8.758	0.000
ACSS09	0.935	0.101	9.232	0.000
ACSS10	0.796	0.087	9.149	0.000
ACSS11	0.892	0.102	8.731	0.000
ACSS12	0.868	0.096	9.061	0.000

Group LDS

SCIACCEP BY

ACSS01	1.000	0.000	999.000	999.000
ACSS02	1.006	0.052	19.432	0.000
ACSS03	0.609	0.075	8.104	0.000
ACSS04	0.643	0.059	10.916	0.000
ACSS05	0.810	0.056	14.430	0.000
ACSS06	0.982	0.049	19.847	0.000
ACSS07	0.690	0.055	12.611	0.000
ACSS08	1.174	0.052	22.587	0.000
ACSS09	1.018	0.053	19.312	0.000
ACSS10	1.041	0.042	24.826	0.000
ACSS11	1.120	0.045	25.021	0.000
ACSS12	0.994	0.044	22.565	0.000

RBELIEFS BY

ACRS01	1.000	0.000	999.000	999.000
ACRS02	0.248	0.050	4.973	0.000
ACRS03	0.849	0.042	20.425	0.000
ACRS04	0.817	0.046	17.825	0.000
ACRS05	0.988	0.033	30.223	0.000
ACRS06	0.734	0.053	13.935	0.000
ACRS07	0.467	0.063	7.403	0.000
ACRS08	0.721	0.049	14.753	0.000
ACRS09	0.908	0.042	21.474	0.000
ACRS11	0.557	0.059	9.454	0.000
ACRS13	0.624	0.051	12.232	0.000

RPRACTIC BY				
RELIG07	1.000	0.000	999.000	999.000
RELIG05	1.028	0.050	20.659	0.000
RELIG08	0.958	0.066	14.519	0.000
RELIG04	0.985	0.061	16.045	0.000
RINFLUEN BY				
RELIG09	1.000	0.000	999.000	999.000
RELIG10	1.044	0.068	15.455	0.000
RELIG11	1.047	0.053	19.736	0.000
RELIG12	1.169	0.055	21.249	0.000
RELIG13	1.097	0.057	19.321	0.000
RHOPE BY				
RELIG14	1.000	0.000	999.000	999.000
RELIG15	0.207	0.050	4.172	0.000
RELIG16	0.830	0.072	11.466	0.000
RELIG17	0.636	0.064	9.900	0.000
RELIG18	0.236	0.058	4.053	0.000
SCIACCEP ON				
RBELIEFS	-0.602	0.068	-8.906	0.000
RPRACTIC	-0.160	0.052	-3.110	0.002
RINFLUEN	0.051	0.037	1.400	0.161
RHOPE	0.192	0.051	3.786	0.000
RBELIEFS ON				
RPRACTIC	-0.084	0.081	-1.036	0.300
RINFLUEN	0.269	0.066	4.065	0.000
RHOPE	0.468	0.067	7.034	0.000
RINFLUEN WITH				
RPRACTIC	0.258	0.200	1.292	0.196
RHOPE WITH				
RPRACTIC	0.117	0.094	1.249	0.212
RINFLUEN	0.866	0.349	2.483	0.013
Means				
RPRACTIC	0.172	0.182	0.947	0.344
RINFLUEN	1.793	0.634	2.829	0.005
RHOPE	0.214	0.709	0.302	0.763
Intercepts				
SCIACCEP	0.000	0.000	999.000	999.000
RBELIEFS	-0.715	0.190	-3.759	0.000

Thresholds

RELIG04$1	-0.134	0.088	-1.516	0.130
RELIG04$2	-0.048	0.079	-0.602	0.547
RELIG04$3	0.053	0.113	0.469	0.639
RELIG04$4	0.391	0.317	1.236	0.217
RELIG04$5	0.905	0.651	1.390	0.164
RELIG05$1	-0.048	0.082	-0.587	0.558
RELIG05$2	-0.024	0.089	-0.270	0.787
RELIG05$3	0.571	0.439	1.302	0.193
RELIG05$4	1.002	0.728	1.376	0.169
RELIG05$5	1.161	0.857	1.355	0.175
RELIG07$1	-0.145	0.092	-1.576	0.115
RELIG07$2	-0.038	0.083	-0.461	0.644
RELIG07$3	0.583	0.443	1.316	0.188
RELIG07$4	0.818	0.594	1.377	0.169
RELIG08$1	0.054	0.106	0.508	0.612
RELIG08$2	0.435	0.346	1.255	0.210
RELIG08$3	0.627	0.476	1.316	0.188
RELIG08$4	0.985	0.721	1.367	0.172
RELIG08$5	1.098	0.790	1.391	0.164
RELIG09$1	-0.459	0.083	-5.535	0.000
RELIG09$2	0.075	0.101	0.740	0.459
RELIG09$3	0.973	0.424	2.296	0.022
RELIG09$4	1.601	0.586	2.735	0.006
RELIG09$5	2.695	0.869	3.102	0.002
RELIG10$1	-0.441	0.084	-5.273	0.000
RELIG10$2	0.085	0.282	0.304	0.761
RELIG10$3	0.787	0.416	1.891	0.059
RELIG10$4	1.392	0.549	2.535	0.011
RELIG10$5	2.837	0.920	3.084	0.002
RELIG11$1	-0.764	0.093	-8.208	0.000
RELIG11$2	0.417	0.320	1.303	0.193
RELIG11$3	1.296	0.518	2.504	0.012
RELIG11$4	2.298	0.773	2.972	0.003
RELIG11$5	3.897	1.191	3.271	0.001
RELIG12$1	-0.830	0.100	-8.294	0.000
RELIG12$2	-0.025	0.253	-0.101	0.920
RELIG12$3	0.978	0.468	2.091	0.037
RELIG12$4	2.068	0.732	2.825	0.005
RELIG12$5	3.592	1.120	3.209	0.001
RELIG13$1	-1.411	0.133	-10.586	0.000
RELIG13$2	-0.831	0.213	-3.900	0.000
RELIG13$3	0.345	0.316	1.093	0.275
RELIG13$4	1.296	0.525	2.469	0.014
RELIG13$5	2.751	0.889	3.092	0.002

RELIG14$1	-2.607	0.239	-10.893	0.000
RELIG14$2	-2.278	0.216	-10.538	0.000
RELIG14$3	-1.512	0.345	-4.388	0.000
RELIG14$4	-0.878	0.462	-1.901	0.057
RELIG15$1	-1.164	0.193	-6.019	0.000
RELIG15$2	-0.856	0.194	-4.412	0.000
RELIG15$3	-0.565	0.152	-3.728	0.000
RELIG15$4	-0.230	0.132	-1.735	0.083
RELIG15$5	0.127	0.167	0.763	0.445
RELIG16$1	-2.446	0.250	-9.796	0.000
RELIG16$2	-1.886	0.308	-6.131	0.000
RELIG16$3	-1.110	0.370	-3.002	0.003
RELIG16$4	-0.369	0.487	-0.759	0.448
RELIG17$1	-1.854	0.161	-11.516	0.000
RELIG17$2	-1.572	0.217	-7.239	0.000
RELIG17$3	-1.122	0.238	-4.721	0.000
RELIG17$4	-0.513	0.327	-1.569	0.117
RELIG17$5	0.288	0.491	0.587	0.557
RELIG18$1	-1.351	0.267	-5.052	0.000
RELIG18$2	-1.210	0.309	-3.913	0.000
RELIG18$3	-0.954	0.247	-3.865	0.000
RELIG18$4	-0.406	0.158	-2.567	0.010
RELIG18$5	0.183	0.202	0.906	0.365
ACRS01$1	-1.947	0.152	-12.842	0.000
ACRS01$2	-1.387	0.129	-10.712	0.000
ACRS01$3	-0.879	0.211	-4.177	0.000
ACRS02$1	-0.784	0.149	-5.260	0.000
ACRS02$2	-0.497	0.111	-4.475	0.000
ACRS02$3	-0.293	0.077	-3.792	0.000
ACRS02$4	-0.121	0.068	-1.779	0.075
ACRS02$5	0.053	0.085	0.621	0.534
ACRS03$1	-1.692	0.111	-15.269	0.000
ACRS03$2	-1.206	0.174	-6.952	0.000
ACRS03$3	-0.977	0.179	-5.459	0.000
ACRS03$4	-0.552	0.210	-2.634	0.008
ACRS03$5	0.077	0.277	0.277	0.781
ACRS04$1	-2.166	0.169	-12.813	0.000
ACRS04$2	-1.613	0.206	-7.841	0.000
ACRS04$3	-1.376	0.168	-8.191	0.000
ACRS04$4	-1.108	0.158	-7.028	0.000
ACRS04$5	-0.505	0.197	-2.563	0.010
ACRS05$1	-2.156	0.163	-13.187	0.000
ACRS05$2	-1.841	0.210	-8.771	0.000
ACRS05$3	-1.415	0.199	-7.117	0.000
ACRS05$4	-0.706	0.229	-3.086	0.002
ACRS05$5	-0.145	0.287	-0.506	0.613

ACRS06$1	-1.614	0.120	-13.473	0.000
ACRS06$2	-1.254	0.137	-9.133	0.000
ACRS06$3	-0.906	0.134	-6.737	0.000
ACRS06$4	-0.576	0.156	-3.702	0.000
ACRS06$5	-0.140	0.205	-0.686	0.493
ACRS07$1	-0.750	0.096	-7.833	0.000
ACRS07$2	-0.303	0.123	-2.457	0.014
ACRS07$3	-0.058	0.146	-0.395	0.693
ACRS07$4	0.308	0.199	1.546	0.122
ACRS07$5	0.693	0.270	2.567	0.010
ACRS08$1	-1.496	0.116	-12.951	0.000
ACRS08$2	-1.083	0.173	-6.241	0.000
ACRS08$3	-0.289	0.203	-1.428	0.153
ACRS08$4	0.480	0.309	1.551	0.121
ACRS08$5	1.180	0.428	2.754	0.006
ACRS09$1	-1.917	0.133	-14.406	0.000
ACRS09$2	-1.982	0.203	-9.750	0.000
ACRS09$3	-1.585	0.183	-8.680	0.000
ACRS09$4	-0.961	0.180	-5.328	0.000
ACRS09$5	-0.336	0.238	-1.414	0.157
ACRS11$1	-1.284	0.113	-11.396	0.000
ACRS11$2	-0.940	0.142	-6.641	0.000
ACRS11$3	-0.577	0.134	-4.308	0.000
ACRS11$4	-0.194	0.161	-1.202	0.229
ACRS11$5	0.288	0.231	1.243	0.214
ACRS13$1	-0.843	0.087	-9.650	0.000
ACRS13$2	-0.092	0.190	-0.485	0.628
ACRS13$3	0.348	0.257	1.356	0.175
ACRS13$4	0.736	0.317	2.319	0.020
ACRS13$5	1.162	0.394	2.950	0.003
ACSS01$1	-0.335	0.077	-4.322	0.000
ACSS01$2	0.051	0.073	0.701	0.483
ACSS01$3	0.591	0.118	5.010	0.000
ACSS01$4	1.018	0.164	6.215	0.000
ACSS01$5	1.497	0.222	6.738	0.000
ACSS02$1	-0.630	0.087	-7.232	0.000
ACSS02$2	-0.188	0.092	-2.047	0.041
ACSS02$3	0.252	0.102	2.479	0.013
ACSS02$4	0.871	0.154	5.671	0.000
ACSS02$5	1.457	0.229	6.364	0.000
ACSS03$1	-1.372	0.150	-9.145	0.000
ACSS03$2	-1.571	0.318	-4.944	0.000
ACSS03$3	-1.192	0.246	-4.842	0.000
ACSS03$4	-0.343	0.119	-2.881	0.004
ACSS03$5	0.537	0.135	3.993	0.000
ACSS04$1	-0.941	0.103	-9.118	0.000

ACSS04$2	-0.484	0.113	-4.279	0.000
ACSS04$3	-0.084	0.086	-0.968	0.333
ACSS04$4	0.509	0.113	4.522	0.000
ACSS04$5	1.027	0.178	5.777	0.000
ACSS05$1	-0.838	0.090	-9.277	0.000
ACSS05$2	-0.406	0.100	-4.054	0.000
ACSS05$3	0.052	0.086	0.605	0.545
ACSS05$4	0.654	0.118	5.536	0.000
ACSS05$5	1.097	0.164	6.685	0.000
ACSS06$1	-0.956	0.101	-9.457	0.000
ACSS06$2	-0.763	0.130	-5.853	0.000
ACSS06$3	-0.289	0.103	-2.802	0.005
ACSS06$4	0.348	0.111	3.135	0.002
ACSS06$5	0.850	0.148	5.745	0.000
ACSS07$1	-1.116	0.106	-10.555	0.000
ACSS07$2	-0.995	0.210	-4.746	0.000
ACSS07$3	-0.504	0.145	-3.484	0.000
ACSS07$4	0.431	0.124	3.480	0.001
ACSS07$5	1.142	0.213	5.356	0.000
ACSS08$1	-0.326	0.085	-3.835	0.000
ACSS08$2	0.144	0.097	1.486	0.137
ACSS08$3	0.555	0.117	4.750	0.000
ACSS08$4	1.048	0.159	6.607	0.000
ACSS08$5	1.353	0.188	7.201	0.000
ACSS09$1	-1.018	0.104	-9.754	0.000
ACSS09$2	-0.939	0.155	-6.078	0.000
ACSS09$3	-0.553	0.127	-4.355	0.000
ACSS09$4	0.236	0.115	2.058	0.040
ACSS09$5	0.914	0.157	5.837	0.000
ACSS10$1	-0.882	0.098	-9.040	0.000
ACSS10$2	-0.742	0.133	-5.586	0.000
ACSS10$3	-0.013	0.107	-0.120	0.905
ACSS10$4	0.751	0.142	5.308	0.000
ACSS10$5	1.392	0.204	6.836	0.000
ACSS11$1	-0.203	0.080	-2.540	0.011
ACSS11$2	0.167	0.094	1.777	0.076
ACSS11$3	0.519	0.113	4.599	0.000
ACSS11$4	0.932	0.145	6.422	0.000
ACSS11$5	1.210	0.173	7.011	0.000
ACSS12$1	-0.723	0.093	-7.751	0.000
ACSS12$2	-0.305	0.098	-3.105	0.002
ACSS12$3	0.117	0.097	1.210	0.226
ACSS12$4	0.627	0.123	5.114	0.000
ACSS12$5	1.161	0.171	6.806	0.000

Variances

RPRACTIC	0.119	0.160	0.744	0.457
RINFLUEN	2.467	1.327	1.859	0.063
RHOPE	1.270	0.663	1.915	0.055
Residual Variances				
SCIACCEP	0.199	0.053	3.769	0.000
RBELIEFS	0.245	0.081	3.039	0.002
Scales				
RELIG04	2.403	1.612	1.491	0.136
RELIG05	2.583	1.747	1.479	0.139
RELIG07	2.846	1.901	1.497	0.134
RELIG08	2.157	1.466	1.471	0.141
RELIG09	0.575	0.155	3.707	0.000
RELIG10	0.521	0.139	3.748	0.000
RELIG11	0.529	0.141	3.754	0.000
RELIG12	0.492	0.130	3.775	0.000
RELIG13	0.524	0.138	3.791	0.000
RELIG14	0.873	0.241	3.618	0.000
RELIG15	1.833	0.462	3.970	0.000
RELIG16	0.976	0.243	4.020	0.000
RELIG17	0.999	0.251	3.985	0.000
RELIG18	1.459	0.422	3.460	0.001
ACRS01	0.957	0.158	6.043	0.000
ACRS02	2.799	0.666	4.204	0.000
ACRS03	0.823	0.127	6.492	0.000
ACRS04	1.106	0.181	6.114	0.000
ACRS05	0.841	0.131	6.412	0.000
ACRS06	1.278	0.211	6.047	0.000
ACRS07	1.252	0.256	4.885	0.000
ACRS08	0.830	0.141	5.875	0.000
ACRS09	0.957	0.157	6.099	0.000
ACRS11	1.111	0.212	5.245	0.000
ACRS13	1.002	0.178	5.615	0.000
ACSS01	1.267	0.142	8.948	0.000
ACSS02	1.229	0.138	8.882	0.000
ACSS03	1.088	0.191	5.700	0.000
ACSS04	1.268	0.174	7.277	0.000
ACSS05	1.306	0.142	9.166	0.000
ACSS06	1.145	0.118	9.712	0.000
ACSS07	0.990	0.156	6.344	0.000
ACSS08	1.303	0.135	9.658	0.000
ACSS09	1.079	0.119	9.087	0.000
ACSS10	1.032	0.113	9.128	0.000
ACSS11	1.365	0.140	9.744	0.000
ACSS12	1.267	0.130	9.763	0.000

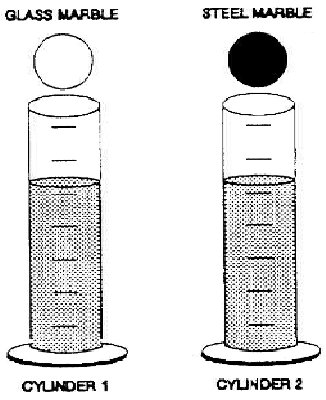
APPENDIX F: Lawson's Classroom Test of Scientific Reasoning

Q5.1a Suppose you are given two clay balls of equal size and shape. The two clay balls also weigh the same. One ball is flattened into a pancake-shaped piece. Which of these statements is correct?

- ❍ The pancake-shaped piece weighs more than the ball
- ❍ The two pieces still weigh the same
- ❍ The ball weighs more than the pancake-shaped piece

Q5.1b because…

- ❍ the flattened piece covers a larger area.
- ❍ the ball pushes down more on one spot.
- ❍ when something is flattened it loses weight.
- ❍ clay has not been added or taken away.
- ❍ when something is flattened it gains weight.

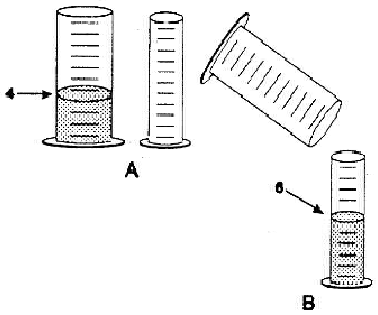


Q5.2a Above are drawings of two cylinders filled to the same level with water. The cylinders are identical in size and shape. Also shown at the right are two marbles, one glass and one steel. The marbles are the same size but the steel one is much heavier than the glass one. When the glass marble is put into Cylinder 1 it sinks to the bottom and the water level rises to the 6th mark. If we put the steel marble into Cylinder 2, the water will rise...

- ❍ to the same level as it did in Cylinder 1
- ❍ to a higher level than it did in Cylinder 1
- ❍ to a lower level than it did in Cylinder 1

Q5.2b because...

- ❍ the steel marble will sink faster.
- ❍ the marbles are made of different materials.
- ❍ the steel marble is heavier than the glass marble.
- ❍ the glass marble creates less pressure.
- ❍ the marbles are the same size.



Q5.3a Above are drawings of a wide and a narrow cylinder. The cylinders have equally spaced marks on them. Water is poured into the wide cylinder up to the 4th mark (see A). This water rises to the 6th mark when poured into the narrow cylinder (see B). Both cylinders are emptied (not shown) and water is poured into the wide cylinder up to the 6th mark. How high would this water rise if it were poured into the empty narrow cylinder?

- ❍ to about 8
- ❍ to about 9
- ❍ to about 10
- ❍ to about 12
- ❍ none of these answers is correct

Q5.3b because...

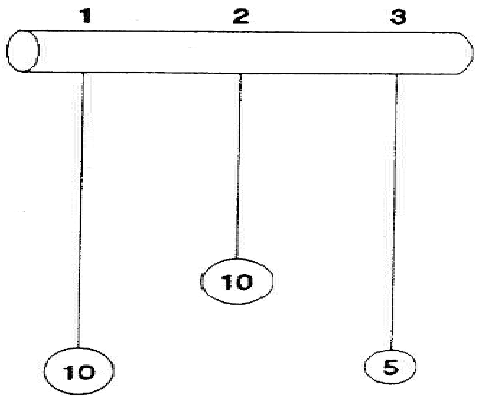
- ❍ the answer can not be determined with the information given.
- ❍ it went up 2 more before, so it will go up 2 more again.
- ❍ it goes up 3 in the narrow for every 2 in the wide.
- ❍ the second cylinder is narrower.
- ❍ one must actually pour the water and observe to find out.

Q5.4a Water is now poured into the narrow cylinder (described in previous question) up to the 11th mark. How high would this water rise if it were poured into the empty wide cylinder?

- ❍ to about 7 1/2
- ❍ to about 9
- ❍ to about 8
- ❍ to about 7 1/3
- ❍ none of these answers is correct

Q5.4b because...

- ❍ the ratios must stay the same.
- ❍ one must actually pour the water and observe to find out.
- ❍ the answer can not be determined with the information given.
- ❍ it was 2 less before so it will be 2 less again.
- ❍ you subtract 2 from the wide for every 3 from the narrow.

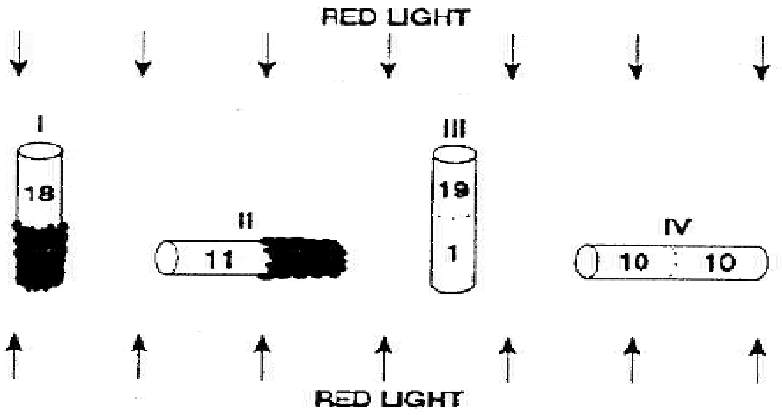


Q5.5a Above is a drawing of three strings hanging from a bar. The three strings have metal weights attached to their ends. String 1 and String 3 are the same length. String 2 is shorter. A 10-unit weight is attached to the end of String 1. A 10-unit weight is also attached to the end of String 2. A 5-unit weight is attached to the end of String 3. The strings (and attached weights) can be swung back and forth and the time it takes to make a swing can be timed. Suppose you want to find out whether the length of the string has an effect on the time it takes to swing back and forth. Which strings would you use to find out?

- ❍ only one string
- ❍ all three strings
- ❍ 2 and 3
- ❍ 1 and 3
- ❍ 1 and 2

Q5.5b because...

- ❍ you must use the longest strings.
- ❍ you must compare strings with both light and heavy weights.
- ❍ only the lengths differ.
- ❍ to make all possible comparisons.
- ❍ the weights differ.

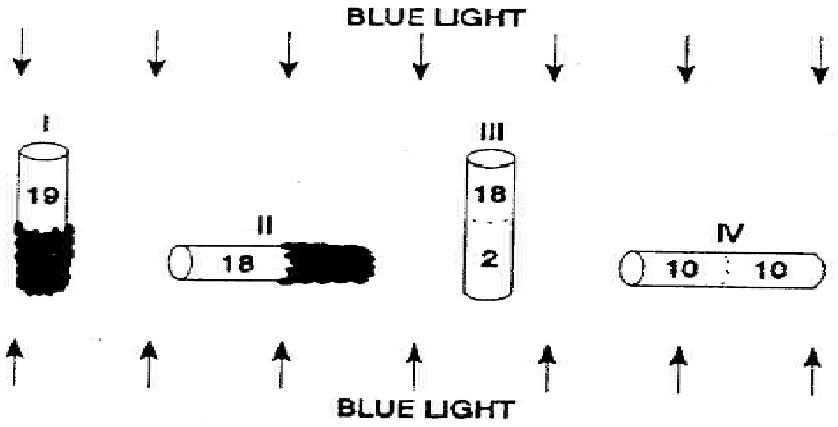


Q5.6a Twenty fruit flies are placed in each of four glass tubes. The tubes are sealed. Tubes I and II are partially covered with black paper; Tubes III and IV are not covered. The tubes are placed as shown. Then they are exposed to red light for five minutes. The number of flies in the uncovered part of each tube is shown in the drawing. This experiment shows that flies respond to (respond means move to or away from):

- ❍ red light but not gravity
- ❍ gravity but not red light
- ❍ both red light and gravity
- ❍ neither red light nor gravity

Q5.6b because...

- ❍ most flies are in the upper end of Tube III but spread about evenly in Tube II.
- ❍ most flies did not go to the bottom of Tubes I and III.
- ❍ the flies need light to see and must fly against gravity.
- ❍ the majority of flies are in the upper ends and in the lighted ends of the tubes.
- ❍ some flies are in both ends of each tube.

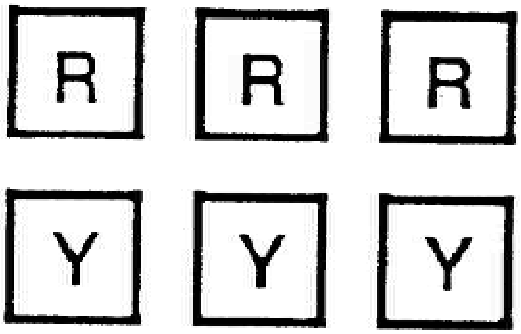


Q5.7a In a second experiment, a different kind of fly and blue light was used. The results are shown in the drawing. These data show that these flies respond to (respond means move to or away from):

- ❍ blue light but not gravity
- ❍ gravity but not blue light
- ❍ both blue light and gravity
- ❍ neither blue light nor gravity

Q5.7b because...

- ❍ some flies are in both ends of each tube.
- ❍ the flies need light to see and must fly against gravity.
- ❍ the flies are spread about evenly in Tube IV and in the upper end of Tube III.
- ❍ most flies are in the lighted end of Tube II but do not go down in Tubes I and III.
- ❍ most flies are in the upper end of Tube I and the lighted end of Tube II.

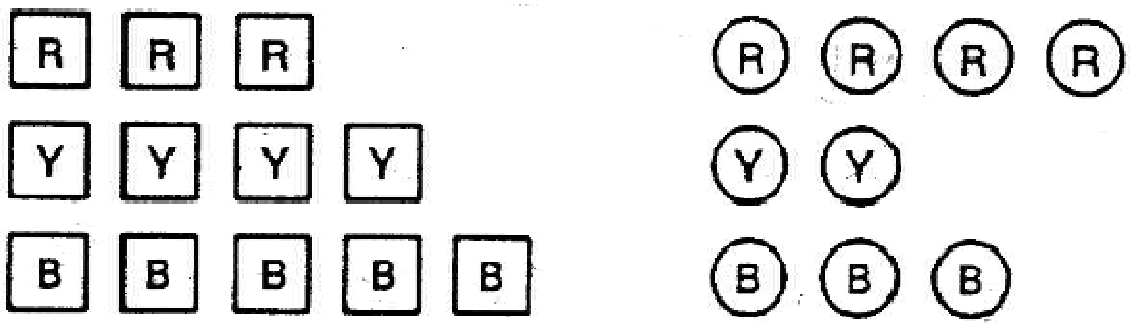


Q5.8a Six square pieces of wood are put into a cloth bag and mixed about. The six pieces are identical in size and shape, however, three pieces are red and three are yellow. Suppose someone reaches into the bag (without looking) and pulls out one piece. What are the chances that the piece is red?

- ❍ 1 chance out of 6
- ❍ 1 chance out of 3
- ❍ 1 chance out of 2
- ❍ 1 chance out of 1
- ❍ can not be determined

Q5.8b because...

- ❍ 3 out of 6 pieces are red.
- ❍ there is no way to tell which piece will be picked.
- ❍ only 1 piece of the 6 in the bag is picked.
- ❍ all 6 pieces are identical in size and shape.
- ❍ only 1 red piece can be picked out of the 3 red pieces.

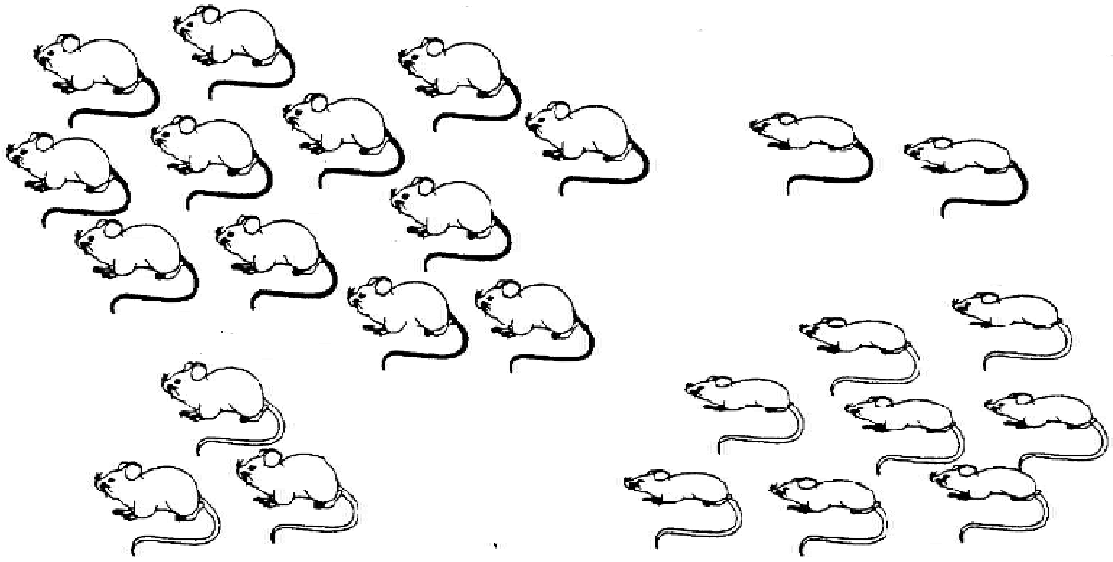


Q5.9a Three red square pieces of wood, four yellow square pieces, and five blue square pieces are put into a cloth bag. Four red round pieces, two yellow round pieces, and three blue round pieces are also put into the bag. All the pieces are then mixed about. Suppose someone reaches into the bag (without looking and without feeling for a particular shape piece) and pulls out one piece. What are the chances that the piece is a red round or blue round piece?

- ❍ 1 chance out of 3
- ❍ 1 chance out of 21
- ❍ 15 chances out of 21
- ❍ 1 chance out of 2

Q5.9b because...

- ❍ 1 of the 2 shapes is round.
- ❍ 15 of the 21 pieces are red or blue.
- ❍ there is no way to tell which piece will be picked.
- ❍ only 1 of the 21 pieces is picked out of the bag.
- ❍ 1 of every 3 pieces is a red or blue round piece.

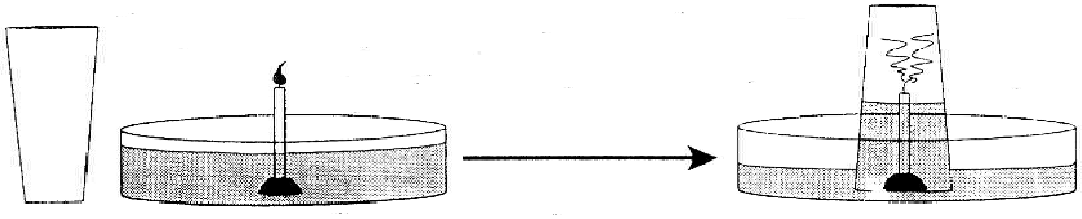


Q5.10a Farmer Brown was observing the mice that live in his field. He discovered that all of them were either fat or thin. Also, all of them had either black tails or white tails. This made him wonder if there might be a link between the size of the mice and the color of their tails. So he captured all of the mice in one part of his field and observed them. Above are the mice that he captured. Do you think there is a link between the size of the mice and the color of their tails?

- ❍ appears to be a link
- ❍ appears not to be a link
- ❍ cannot make a reasonable guess

Q5.10b because...

- ❍ there are some of each kind of mouse.
- ❍ there may be a genetic link between mouse size and tail color.
- ❍ there were not enough mice captured.
- ❍ most of the fat mice have black tails while most of the thin mice have white tails.
- ❍ as the mice grew fatter, their tails became darker.



Q5.11a The figure above at the left shows a drinking glass and a burning birthday candle stuck in a small piece of clay standing in a pan of water. When the glass is turned upside down, put over the candle, and placed in the water, the candle quickly goes out and water rushes up into the glass (shown above). This observation raises an interesting question: Why does the water rush up into the glass? Here is a possible explanation. The flame converts oxygen into carbon dioxide. Because oxygen does not dissolve rapidly into water but carbon dioxide does, the newly-formed carbon dioxide dissolves rapidly into the water, lowering the air pressure inside the glass. Suppose you have the materials mentioned above plus some matches and some dry ice (dry ice is frozen carbon dioxide). Using some or all of the materials, how could you test this possible explanation?

- Saturate the water with carbon dioxide and redo the experiment noting the amount of water rise.
- The water rises because oxygen is consumed, so redo the experiment in exactly the same way to show water rise due to oxygen loss.
- Conduct a controlled experiment varying only the number of candles to see if that makes a difference.
- Suction is responsible for the water rise, so put a balloon over the top of an open-ended cylinder and place the cylinder over the burning candle.
- Redo the experiment, but make sure it is controlled by holding all independent variables constant; then measure the amount of water rise.

Q5.11b What result of your test (mentioned above) would show that your explanation is probably wrong?

- The water rises the same as it did before.
- The water rises less than it did before.
- The balloon expands out.
- The balloon is sucked in.

Magnified Red Blood Cells After Adding Salt Water

Q5.12a A student put a drop of blood on a microscope slide and then looked at the blood under a microscope. As you can see in the diagram above, the magnified red blood cells look like little round balls. After adding a few drops of salt water to the drop of blood, the student noticed that the cells appeared to become smaller. This observation raises an interesting question: Why do the red blood cells appear smaller? Here are two possible explanations: 1. Salt ions (Na+ and Cl-) push on the cell membranes and make the cells appear smaller. 2. Water molecules are attracted to the salt ions so the water molecules move out of the cells and leave the cells smaller. To test these explanations, the student used some salt water, a very accurate weighing device, and some water-filled plastic bags, and assumed the plastic behaves just like red-blood-cell membranes. The experiment involved carefully weighing a water-filled bag in a salt solution for ten minutes and then reweighing the bag. What result of the experiment would best show that explanation I is probably wrong?

- ❍ the bag loses weight
- ❍ the bag weighs the same
- ❍ the bag appears smaller

Q5.12b What result of the experiment would best show that explanation II is probably wrong?

- ❍ the bag loses weight
- ❍ the bag weighs the same
- ❍ the bag appears smaller

APPENDIX G: Religiosity vs. Scientific Reasoning SEM Output

Mplus VERSION 7.31
MUTHEN & MUTHEN
11/06/2015 12:34 PM

INPUT INSTRUCTIONS

```
  TITLE:     Ifluence of Scientific Reasoning_SEM
  DATA:      FILE='F2014.txt';
  VARIABLE:  Names Are ID  RelAffil
           Relig01 Relig02 Relig03 Relig04 Relig05
           RElig06 Relig07 Relig08 Relig09 RElig10
           RElig11 RElig12 Relig13 RElig14 RElig15
           Relig16 Relig17 Relig18
           ACRS01-ACRS13
           ACSS01-ACSS12
           EvolK01-EvolK16
           LCTSR01-LCTSR12;
   USEVARIABLES =
           Relig04 Relig05
           Relig07 Relig08 Relig09 RElig10
           Relig11 RElig12 Relig13 RElig14
           Relig16 Relig17 Relig18
          ACRS01  ACRS02  ACRS03  ACRS04  ACRS05  ACRS06
          ACRS07  ACRS08  ACRS09         ACRS11         ACRS13
           ACSS01  ACSS02  ACSS03  ACSS04  ACSS05  ACSS06  ACSS07
           ACSS08  ACSS09  ACSS10  ACSS11  ACSS12
           LCTSR01 LCTSR02 LCTSR03 LCTSR04 LCTSR05 LCTSR06
           LCTSR07 LCTSR08 LCTSR09 LCTSR10 LCTSR11 LCTSR12;
   CATEGORICAL= All;

   DEFINE:
   IF relig07==6 THEN relig07=5;
   IF relig14==1 THEN relig14=2;
   IF relig16==1 THEN relig16=2;
   IF ACRS01==1 THEN ACRS01=3;
   IF ACRS01==2 THEN ACRS01=3;


   ANALYSIS:

   MODEL:
         SciAccep BY ACSS01  ACSS02  ACSS03  ACSS04  ACSS05  ACSS06
      ACSS07
                  ACSS08  ACSS09  ACSS10  ACSS11  ACSS12 ;
```

```
RBeliefs BY ACRS01  ACRS02  ACRS03  ACRS04  ACRS05
        ACRS06   ACRS07  ACRS08  ACRS09
        ACRS11          ACRS13;


SciReas BY LCTSR01 LCTSR02 LCTSR03 LCTSR04 LCTSR05
     LCTSR06   LCTSR07 LCTSR08 LCTSR09 LCTSR10
     LCTSR11   LCTSR12;


Rpractic BY Relig04 Relig05  Relig07 Relig08;

RInfluen By Relig09 RElig10 Relig11 Relig12 Relig13;


RHope BY Relig14          RElig16 Relig17 Relig18;

ACRS05 with ACRS06;


 OUTPUT: STDYX Modindices(20);


INPUT READING TERMINATED NORMALLY



Ifluence of Scientific Reasoning_SEM

SUMMARY OF ANALYSIS

Number of groups                                 1
Number of observations                           724

Number of dependent variables                    48
Number of independent variables                  0
Number of continuous latent variables            6

Observed dependent variables

 Binary and ordered categorical (ordinal)
  RELIG04    RELIG05    RELIG07    RELIG08    RELIG09    RELIG10
  RELIG11    RELIG12    RELIG13    RELIG14    RELIG16    RELIG17
  RELIG18    ACRS01     ACRS02     ACRS03     ACRS04     ACRS05
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ACRS06 ACRS07 ACRS08 ACRS09 ACRS11 ACRS13
ACSS01 ACSS02 ACSS03 ACSS04 ACSS05 ACSS06
ACSS07 ACSS08 ACSS09 ACSS10 ACSS11 ACSS12
LCTSR01 LCTSR02 LCTSR03 LCTSR04 LCTSR05 LCTSR06
LCTSR07 LCTSR08 LCTSR09 LCTSR10 LCTSR11 LCTSR12

Continuous latent variables
SCIACCEP RBELIEFS SCIREAS RPRACTIC RINFLUEN RHOPE

Estimator WLSMV
Maximum number of iterations 1000
Convergence criterion 0.500D-04
Maximum number of steepest descent iterations 20
Parameterization DELTA

Input data file(s)
F2014.txt

Input data format FREE

UNIVARIATE PROPORTIONS AND COUNTS FOR CATEGORICAL VARIABLES

RELIG04		
Category 1	0.468	339.000
Category 2	0.072	52.000
Category 3	0.123	89.000
Category 4	0.142	103.000
Category 5	0.141	102.000
Category 6	0.054	39.000
RELIG05		
Category 1	0.550	398.000
Category 2	0.055	40.000
Category 3	0.278	201.000
Category 4	0.090	65.000
Category 5	0.012	9.000
Category 6	0.015	11.000
RELIG07		
Category 1	0.457	331.000
Category 2	0.090	65.000
Category 3	0.333	241.000
Category 4	0.090	65.000
Category 5	0.030	22.000
RELIG08		
Category 1	0.612	443.000
Category 2	0.186	135.000
Category 3	0.102	74.000
Category 4	0.069	50.000
Category 5	0.018	13.000
Category 6	0.012	9.000
RELIG09		
Category 1	0.356	258.000
Category 2	0.162	117.000
Category 3	0.157	114.000
Category 4	0.108	78.000
Category 5	0.108	78.000
Category 6	0.109	79.000
RELIG10		
Category 1	0.352	255.000
Category 2	0.167	121.000
Category 3	0.130	94.000
Category 4	0.102	74.000
Category 5	0.133	96.000
Category 6	0.116	84.000
RELIG11		
Category 1	0.280	203.000
Category 2	0.171	124.000

Category 3	0.169	122.000
Category 4	0.151	109.000
Category 5	0.160	116.000
Category 6	0.069	50.000
RELIG12		
Category 1	0.276	200.000
Category 2	0.141	102.000
Category 3	0.195	141.000
Category 4	0.142	103.000
Category 5	0.145	105.000
Category 6	0.101	73.000
RELIG13		
Category 1	0.151	109.000
Category 2	0.113	82.000
Category 3	0.178	129.000
Category 4	0.166	120.000
Category 5	0.206	149.000
Category 6	0.186	135.000
RELIG14		
Category 1	0.064	46.000
Category 2	0.037	27.000
Category 3	0.126	91.000
Category 4	0.163	118.000
Category 5	0.610	442.000
RELIG16		
Category 1	0.057	41.000
Category 2	0.044	32.000
Category 3	0.167	121.000
Category 4	0.229	166.000
Category 5	0.503	364.000
RELIG17		
Category 1	0.072	52.000
Category 2	0.080	58.000
Category 3	0.105	76.000
Category 4	0.192	139.000
Category 5	0.229	166.000
Category 6	0.322	233.000
RELIG18		
Category 1	0.026	19.000
Category 2	0.040	29.000
Category 3	0.079	57.000
Category 4	0.231	167.000
Category 5	0.293	212.000
Category 6	0.331	240.000
ACRS01		
Category 1	0.174	126.000
Category 2	0.113	82.000
Category 3	0.163	118.000
Category 4	0.550	398.000
ACRS02		
Category 1	0.086	62.000
Category 2	0.058	42.000
Category 3	0.072	52.000
Category 4	0.141	102.000
Category 5	0.188	136.000
Category 6	0.456	330.000
ACRS03		
Category 1	0.213	154.000
Category 2	0.152	110.000
Category 3	0.170	123.000
Category 4	0.193	140.000
Category 5	0.142	103.000
Category 6	0.130	94.000
ACRS04		
Category 1	0.186	135.000
Category 2	0.093	67.000
Category 3	0.094	68.000
Category 4	0.128	93.000
Category 5	0.138	100.000
Category 6	0.360	261.000
ACRS05		
Category 1	0.327	237.000
Category 2	0.148	107.000
Category 3	0.124	90.000
Category 4	0.140	101.000
Category 5	0.113	82.000
Category 6	0.148	107.000
ACRS06		
Category 1	0.278	201.000
Category 2	0.177	128.000
Category 3	0.113	82.000
Category 4	0.157	114.000
Category 5	0.133	96.000
Category 6	0.142	103.000
ACRS07		
Category 1	0.155	112.000
Category 2	0.117	85.000
Category 3	0.093	67.000
Category 4	0.133	96.000
Category 5	0.152	110.000
Category 6	0.351	254.000
ACRS08		

Category 1	0.122	88.000
Category 2	0.084	61.000
Category 3	0.140	101.000
Category 4	0.180	130.000
Category 5	0.193	140.000
Category 6	0.282	204.000
ACRS09		
Category 1	0.185	134.000
Category 2	0.135	98.000
Category 3	0.140	101.000
Category 4	0.142	103.000
Category 5	0.148	107.000
Category 6	0.250	181.000
ACRS11		
Category 1	0.138	100.000
Category 2	0.086	62.000
Category 3	0.093	67.000
Category 4	0.134	97.000
Category 5	0.141	102.000
Category 6	0.409	296.000
ACRS13		
Category 1	0.160	116.000
Category 2	0.064	46.000
Category 3	0.099	72.000
Category 4	0.133	96.000
Category 5	0.166	120.000
Category 6	0.378	274.000
ACSS01		
Category 1	0.214	155.000
Category 2	0.128	93.000
Category 3	0.130	94.000
Category 4	0.186	135.000
Category 5	0.177	128.000
Category 6	0.164	119.000
ACSS02		
Category 1	0.062	45.000
Category 2	0.070	51.000
Category 3	0.124	90.000
Category 4	0.294	213.000
Category 5	0.262	190.000
Category 6	0.186	135.000
ACSS03		
Category 1	0.086	62.000
Category 2	0.090	65.000
Category 3	0.149	108.000
Category 4	0.239	173.000
Category 5	0.220	159.000
Category 6	0.217	157.000
ACSS04		
Category 1	0.026	19.000
Category 2	0.015	11.000
Category 3	0.040	29.000
Category 4	0.166	120.000
Category 5	0.338	245.000
Category 6	0.414	300.000
ACSS05		
Category 1	0.090	65.000
Category 2	0.051	37.000
Category 3	0.099	72.000
Category 4	0.189	137.000
Category 5	0.233	169.000
Category 6	0.337	244.000
ACSS06		
Category 1	0.080	58.000
Category 2	0.033	24.000
Category 3	0.073	53.000
Category 4	0.227	164.000
Category 5	0.247	179.000
Category 6	0.340	246.000
ACSS07		
Category 1	0.094	68.000
Category 2	0.106	77.000
Category 3	0.155	112.000
Category 4	0.273	198.000
Category 5	0.204	148.000
Category 6	0.167	121.000
ACSS08		
Category 1	0.117	85.000
Category 2	0.077	56.000
Category 3	0.127	92.000
Category 4	0.256	185.000
Category 5	0.232	168.000
Category 6	0.191	138.000
ACSS09		
Category 1	0.109	79.000
Category 2	0.062	45.000
Category 3	0.156	113.000
Category 4	0.235	170.000
Category 5	0.246	178.000
Category 6	0.192	139.000
ACSS10		
Category 1	0.146	106.000

Category 2	0.099	72.000
Category 3	0.135	98.000
Category 4	0.242	175.000
Category 5	0.214	155.000
Category 6	0.163	118.000
ACSS11		
Category 1	0.236	171.000
Category 2	0.091	66.000
Category 3	0.115	83.000
Category 4	0.152	110.000
Category 5	0.188	136.000
Category 6	0.218	158.000
ACSS12		
Category 1	0.206	149.000
Category 2	0.112	81.000
Category 3	0.127	92.000
Category 4	0.169	122.000
Category 5	0.199	144.000
Category 6	0.188	136.000
LCTSR01		
Category 1	0.105	76.000
Category 2	0.087	63.000
Category 3	0.808	585.000
LCTSR02		
Category 1	0.446	323.000
Category 2	0.047	34.000
Category 3	0.507	367.000
LCTSR03		
Category 1	0.606	439.000
Category 2	0.160	116.000
Category 3	0.233	169.000
LCTSR04		
Category 1	0.500	362.000
Category 2	0.390	282.000
Category 3	0.110	80.000
LCTSR05		
Category 1	0.496	359.000
Category 2	0.174	126.000
Category 3	0.330	239.000
LCTSR06		
Category 1	0.623	451.000
Category 2	0.298	216.000
Category 3	0.079	57.000
LCTSR07		
Category 1	0.468	339.000
Category 2	0.410	297.000
Category 3	0.122	88.000
LCTSR08		
Category 1	0.203	147.000
Category 2	0.316	229.000
Category 3	0.481	348.000
LCTSR09		
Category 1	0.424	307.000
Category 2	0.131	95.000
Category 3	0.445	322.000
LCTSR10		
Category 1	0.439	318.000
Category 2	0.236	171.000
Category 3	0.325	235.000
LCTSR11		
Category 1	0.548	397.000
Category 2	0.360	261.000
Category 3	0.091	66.000
LCTSR12		
Category 1	0.265	192.000
Category 2	0.579	419.000
Category 3	0.156	113.000

THE MODEL ESTIMATION TERMINATED NORMALLY

MODEL FIT INFORMATION

Number of Free Parameters 263

Chi-Square Test of Model Fit

Value 2284.178*

Degrees of Freedom	1064
P-Value	0.0000

* The chi-square value for MLM, MLMV, MLR, ULSMV, WLSM and WLSMV cannot be used for chi-square difference testing in the regular way. MLM, MLR and WLSM chi-square difference testing is described on the Mplus website. MLMV, WLSMV, and ULSMV difference testing is done using the DIFFTEST option.

RMSEA (Root Mean Square Error Of Approximation)

Estimate	0.040	
90 Percent C.I.	0.038	0.042
Probability RMSEA <= .05	1.000	

CFI/TLI

CFI	0.982
TLI	0.981

Chi-Square Test of Model Fit for the Baseline Model

Value	70802.244
Degrees of Freedom	1128
P-Value	0.0000

WRMR (Weighted Root Mean Square Residual)

Value	1.445

MODEL RESULTS

	Estimate	S.E.	Est./S.E.	Two-Tailed P-Value
SCIACCEP BY				
ACSS01	1.000	0.000	999.000	999.000
ACSS02	0.732	0.026	27.896	0.000
ACSS03	0.936	0.020	46.064	0.000
ACSS04	0.671	0.031	21.628	0.000
ACSS05	0.910	0.022	41.069	0.000
ACSS06	0.956	0.020	46.734	0.000
ACSS07	0.643	0.030	21.254	0.000
ACSS08	0.946	0.020	47.649	0.000

ACSS09	0.943	0.020	46.329	0.000
ACSS10	0.953	0.018	51.663	0.000
ACSS11	1.105	0.017	63.224	0.000
ACSS12	1.107	0.018	60.445	0.000
RBELIEFS BY				
ACRS01	1.000	0.000	999.000	999.000
ACRS02	0.952	0.013	74.806	0.000
ACRS03	0.774	0.021	36.987	0.000
ACRS04	0.914	0.014	64.676	0.000
ACRS05	0.633	0.028	22.745	0.000
ACRS06	0.706	0.024	28.904	0.000
ACRS07	0.928	0.013	69.080	0.000
ACRS08	0.612	0.027	22.822	0.000
ACRS09	0.775	0.021	36.571	0.000
ACRS11	0.995	0.011	91.286	0.000
ACRS13	0.956	0.012	76.536	0.000
SCIREAS BY				
LCTSR01	1.000	0.000	999.000	999.000
LCTSR02	1.125	0.106	10.583	0.000
LCTSR03	1.190	0.115	10.346	0.000
LCTSR04	1.211	0.107	11.342	0.000
LCTSR05	1.184	0.111	10.669	0.000
LCTSR06	0.457	0.097	4.711	0.000
LCTSR07	0.659	0.097	6.820	0.000
LCTSR08	1.264	0.108	11.724	0.000
LCTSR09	1.376	0.118	11.660	0.000
LCTSR10	0.811	0.102	7.976	0.000
LCTSR11	0.485	0.096	5.029	0.000
LCTSR12	0.512	0.092	5.559	0.000
RPRACTIC BY				
RELIG04	1.000	0.000	999.000	999.000
RELIG05	0.962	0.024	39.633	0.000
RELIG07	0.949	0.025	37.552	0.000
RELIG08	0.791	0.029	27.115	0.000
RINFLUEN BY				
RELIG09	1.000	0.000	999.000	999.000
RELIG10	0.852	0.021	40.406	0.000
RELIG11	0.970	0.015	62.983	0.000
RELIG12	1.023	0.016	65.796	0.000
RELIG13	0.987	0.018	56.002	0.000
RHOPE BY				

RELIG14	1.000	0.000	999.000	999.000
RELIG16	0.880	0.020	43.131	0.000
RELIG17	0.791	0.023	34.589	0.000
RELIG18	0.405	0.036	11.293	0.000
RBELIEFS WITH				
SCIACCEP	-0.592	0.021	-27.552	0.000
SCIREAS WITH				
SCIACCEP	-0.022	0.020	-1.095	0.274
RBELIEFS	0.004	0.023	0.190	0.849
RPRACTIC WITH				
SCIACCEP	-0.361	0.028	-13.082	0.000
RBELIEFS	0.485	0.027	18.226	0.000
SCIREAS	-0.008	0.024	-0.314	0.754
RINFLUEN WITH				
SCIACCEP	-0.391	0.025	-15.848	0.000
RBELIEFS	0.576	0.023	25.420	0.000
SCIREAS	0.003	0.022	0.146	0.884
RPRACTIC	0.607	0.022	27.475	0.000
RHOPE WITH				
SCIACCEP	-0.474	0.028	-16.855	0.000
RBELIEFS	0.796	0.019	41.016	0.000
SCIREAS	-0.012	0.026	-0.473	0.636
RPRACTIC	0.505	0.032	15.829	0.000
RINFLUEN	0.554	0.028	19.630	0.000
ACRS05 WITH				
ACRS06	0.479	0.027	17.922	0.000
Thresholds				
RELIG04$1	-0.080	0.047	-1.709	0.087
RELIG04$2	0.101	0.047	2.155	0.031
RELIG04$3	0.421	0.048	8.743	0.000
RELIG04$4	0.861	0.053	16.108	0.000
RELIG04$5	1.608	0.077	20.978	0.000
RELIG05$1	0.125	0.047	2.675	0.007
RELIG05$2	0.266	0.047	5.643	0.000
RELIG05$3	1.188	0.061	19.561	0.000
RELIG05$4	1.917	0.096	19.994	0.000
RELIG05$5	2.165	0.119	18.235	0.000
RELIG07$1	-0.108	0.047	-2.304	0.021
RELIG07$2	0.118	0.047	2.527	0.012

RELIG07$3	1.174	0.060	19.456	0.000
RELIG07$4	1.875	0.093	20.214	0.000
RELIG08$1	0.284	0.047	6.013	0.000
RELIG08$2	0.836	0.053	15.768	0.000
RELIG08$3	1.285	0.064	20.190	0.000
RELIG08$4	1.875	0.093	20.214	0.000
RELIG08$5	2.244	0.128	17.546	0.000
RELIG09$1	-0.368	0.048	-7.712	0.000
RELIG09$2	0.045	0.047	0.966	0.334
RELIG09$3	0.455	0.048	9.404	0.000
RELIG09$4	0.783	0.052	15.010	0.000
RELIG09$5	1.231	0.062	19.865	0.000
RELIG10$1	-0.379	0.048	-7.933	0.000
RELIG10$2	0.048	0.047	1.041	0.298
RELIG10$3	0.383	0.048	8.007	0.000
RELIG10$4	0.679	0.051	13.390	0.000
RELIG10$5	1.195	0.061	19.613	0.000
RELIG11$1	-0.582	0.050	-11.737	0.000
RELIG11$2	-0.121	0.047	-2.601	0.009
RELIG11$3	0.306	0.047	6.457	0.000
RELIG11$4	0.741	0.052	14.381	0.000
RELIG11$5	1.483	0.071	20.909	0.000
RELIG12$1	-0.594	0.050	-11.954	0.000
RELIG12$2	-0.209	0.047	-4.457	0.000
RELIG12$3	0.284	0.047	6.013	0.000
RELIG12$4	0.688	0.051	13.532	0.000
RELIG12$5	1.277	0.063	20.146	0.000
RELIG13$1	-1.034	0.057	-18.185	0.000
RELIG13$2	-0.632	0.050	-12.603	0.000
RELIG13$3	-0.146	0.047	-3.121	0.002
RELIG13$4	0.273	0.047	5.791	0.000
RELIG13$5	0.891	0.054	16.511	0.000
RELIG14$1	-1.526	0.073	-20.966	0.000
RELIG14$2	-1.277	0.063	-20.146	0.000
RELIG14$3	-0.750	0.052	-14.521	0.000
RELIG14$4	-0.281	0.047	-5.939	0.000
RELIG16$1	-1.584	0.075	-20.987	0.000
RELIG16$2	-1.277	0.063	-20.146	0.000
RELIG16$3	-0.619	0.050	-12.387	0.000
RELIG16$4	-0.007	0.047	-0.149	0.882
RELIG17$1	-1.462	0.070	-20.870	0.000
RELIG17$2	-1.028	0.057	-18.124	0.000
RELIG17$3	-0.653	0.050	-12.962	0.000
RELIG17$4	-0.128	0.047	-2.749	0.006
RELIG17$5	0.463	0.048	9.551	0.000
RELIG18$1	-1.939	0.098	-19.867	0.000

RELIG18$2	-1.504	0.072	-20.941	0.000
RELIG18$3	-1.058	0.057	-18.429	0.000
RELIG18$4	-0.317	0.047	-6.679	0.000
RELIG18$5	0.436	0.048	9.037	0.000
ACRS01$1	-0.938	0.055	-17.106	0.000
ACRS01$2	-0.561	0.049	-11.375	0.000
ACRS01$3	-0.125	0.047	-2.675	0.007
ACRS02$1	-1.368	0.066	-20.586	0.000
ACRS02$2	-1.064	0.058	-18.489	0.000
ACRS02$3	-0.788	0.052	-15.079	0.000
ACRS02$4	-0.368	0.048	-7.712	0.000
ACRS02$5	0.111	0.047	2.378	0.017
ACRS03$1	-0.797	0.052	-15.218	0.000
ACRS03$2	-0.346	0.048	-7.270	0.000
ACRS03$3	0.087	0.047	1.858	0.063
ACRS03$4	0.606	0.050	12.171	0.000
ACRS03$5	1.127	0.059	19.071	0.000
ACRS04$1	-0.891	0.054	-16.511	0.000
ACRS04$2	-0.586	0.050	-11.810	0.000
ACRS04$3	-0.324	0.047	-6.826	0.000
ACRS04$4	0.003	0.047	0.074	0.941
ACRS04$5	0.357	0.048	7.491	0.000
ACRS05$1	-0.447	0.048	-9.257	0.000
ACRS05$2	-0.062	0.047	-1.338	0.181
ACRS05$3	0.252	0.047	5.346	0.000
ACRS05$4	0.640	0.050	12.747	0.000
ACRS05$5	1.046	0.057	18.308	0.000
ACRS06$1	-0.590	0.050	-11.882	0.000
ACRS06$2	-0.115	0.047	-2.452	0.014
ACRS06$3	0.170	0.047	3.641	0.000
ACRS06$4	0.598	0.050	12.027	0.000
ACRS06$5	1.070	0.058	18.549	0.000
ACRS07$1	-1.016	0.056	-18.000	0.000
ACRS07$2	-0.606	0.050	-12.171	0.000
ACRS07$3	-0.346	0.048	-7.270	0.000
ACRS07$4	-0.007	0.047	-0.149	0.882
ACRS07$5	0.383	0.048	8.007	0.000
ACRS08$1	-1.167	0.060	-19.402	0.000
ACRS08$2	-0.821	0.053	-15.563	0.000
ACRS08$3	-0.398	0.048	-8.302	0.000
ACRS08$4	0.062	0.047	1.338	0.181
ACRS08$5	0.578	0.050	11.665	0.000
ACRS09$1	-0.896	0.054	-16.578	0.000
ACRS09$2	-0.466	0.048	-9.624	0.000
ACRS09$3	-0.101	0.047	-2.155	0.031
ACRS09$4	0.259	0.047	5.494	0.000

ACRS09$5	0.674	0.051	13.319	0.000
ACRS11$1	-1.089	0.058	-18.726	0.000
ACRS11$2	-0.760	0.052	-14.661	0.000
ACRS11$3	-0.478	0.049	-9.844	0.000
ACRS11$4	-0.125	0.047	-2.675	0.007
ACRS11$5	0.231	0.047	4.902	0.000
ACRS13$1	-0.994	0.056	-17.749	0.000
ACRS13$2	-0.760	0.052	-14.661	0.000
ACRS13$3	-0.459	0.048	-9.478	0.000
ACRS13$4	-0.111	0.047	-2.378	0.017
ACRS13$5	0.310	0.047	6.531	0.000
ACSS01$1	-0.792	0.052	-15.149	0.000
ACSS01$2	-0.406	0.048	-8.449	0.000
ACSS01$3	-0.069	0.047	-1.486	0.137
ACSS01$4	0.409	0.048	8.523	0.000
ACSS01$5	0.977	0.056	17.558	0.000
ACSS02$1	-1.537	0.073	-20.975	0.000
ACSS02$2	-1.114	0.059	-18.958	0.000
ACSS02$3	-0.653	0.050	-12.962	0.000
ACSS02$4	0.128	0.047	2.749	0.006
ACSS02$5	0.891	0.054	16.511	0.000
ACSS03$1	-1.368	0.066	-20.586	0.000
ACSS03$2	-0.933	0.055	-17.041	0.000
ACSS03$3	-0.455	0.048	-9.404	0.000
ACSS03$4	0.160	0.047	3.418	0.001
ACSS03$5	0.783	0.052	15.010	0.000
ACSS04$1	-1.939	0.098	-19.867	0.000
ACSS04$2	-1.734	0.084	-20.763	0.000
ACSS04$3	-1.395	0.067	-20.685	0.000
ACSS04$4	-0.683	0.051	-13.461	0.000
ACSS04$5	0.216	0.047	4.605	0.000
ACSS05$1	-1.342	0.066	-20.477	0.000
ACSS05$2	-1.076	0.058	-18.608	0.000
ACSS05$3	-0.705	0.051	-13.816	0.000
ACSS05$4	-0.177	0.047	-3.789	0.000
ACSS05$5	0.421	0.048	8.743	0.000
ACSS06$1	-1.404	0.068	-20.715	0.000
ACSS06$2	-1.209	0.061	-19.715	0.000
ACSS06$3	-0.891	0.054	-16.511	0.000
ACSS06$4	-0.220	0.047	-4.679	0.000
ACSS06$5	0.413	0.048	8.596	0.000
ACSS07$1	-1.317	0.065	-20.359	0.000
ACSS07$2	-0.841	0.053	-15.836	0.000
ACSS07$3	-0.372	0.048	-7.786	0.000
ACSS07$4	0.328	0.047	6.900	0.000
ACSS07$5	0.966	0.055	17.430	0.000

ACSS08$1	-1.188	0.061	-19.561	0.000
ACSS08$2	-0.861	0.053	-16.108	0.000
ACSS08$3	-0.463	0.048	-9.551	0.000
ACSS08$4	0.195	0.047	4.160	0.000
ACSS08$5	0.876	0.054	16.310	0.000
ACSS09$1	-1.231	0.062	-19.865	0.000
ACSS09$2	-0.949	0.055	-17.236	0.000
ACSS09$3	-0.447	0.048	-9.257	0.000
ACSS09$4	0.156	0.047	3.344	0.001
ACSS09$5	0.871	0.054	16.243	0.000
ACSS10$1	-1.052	0.057	-18.368	0.000
ACSS10$2	-0.688	0.051	-13.532	0.000
ACSS10$3	-0.302	0.047	-6.383	0.000
ACSS10$4	0.313	0.047	6.605	0.000
ACSS10$5	0.982	0.056	17.622	0.000
ACSS11$1	-0.719	0.051	-14.029	0.000
ACSS11$2	-0.447	0.048	-9.257	0.000
ACSS11$3	-0.146	0.047	-3.121	0.002
ACSS11$4	0.238	0.047	5.050	0.000
ACSS11$5	0.778	0.052	14.940	0.000
ACSS12$1	-0.821	0.053	-15.563	0.000
ACSS12$2	-0.474	0.049	-9.771	0.000
ACSS12$3	-0.139	0.047	-2.972	0.003
ACSS12$4	0.288	0.047	6.087	0.000
ACSS12$5	0.886	0.054	16.444	0.000
LCTSR01$1	-1.254	0.063	-20.008	0.000
LCTSR01$2	-0.871	0.054	-16.243	0.000
LCTSR02$1	-0.135	0.047	-2.898	0.004
LCTSR02$2	-0.017	0.047	-0.372	0.710
LCTSR03$1	0.270	0.047	5.717	0.000
LCTSR03$2	0.728	0.051	14.170	0.000
LCTSR04$1	0.000	0.047	0.000	1.000
LCTSR04$2	1.224	0.062	19.816	0.000
LCTSR05$1	-0.010	0.047	-0.223	0.824
LCTSR05$2	0.440	0.048	9.111	0.000
LCTSR06$1	0.313	0.047	6.605	0.000
LCTSR06$2	1.414	0.068	20.745	0.000
LCTSR07$1	-0.080	0.047	-1.709	0.087
LCTSR07$2	1.167	0.060	19.402	0.000
LCTSR08$1	-0.831	0.053	-15.700	0.000
LCTSR08$2	0.048	0.047	1.041	0.298
LCTSR09$1	-0.192	0.047	-4.086	0.000
LCTSR09$2	0.139	0.047	2.972	0.003
LCTSR10$1	-0.153	0.047	-3.269	0.001
LCTSR10$2	0.455	0.048	9.404	0.000
LCTSR11$1	0.121	0.047	2.601	0.009

LCTSR11$2	1.334	0.065	20.439	0.000
LCTSR12$1	-0.627	0.050	-12.531	0.000
LCTSR12$2	1.011	0.056	17.937	0.000

Variances

SCIACCEP	0.737	0.023	32.382	0.000
RBELIEFS	0.909	0.017	54.960	0.000
SCIREAS	0.299	0.046	6.464	0.000
RPRACTIC	0.889	0.033	26.591	0.000
RINFLUEN	0.841	0.022	38.841	0.000
RHOPE	0.992	0.026	38.136	0.000

STANDARDIZED MODEL RESULTS

STDYX Standardization

	Estimate	S.E.	Two-Tailed Est./S.E.	P-Value
SCIACCEP BY				
ACSS01	0.858	0.013	64.764	0.000
ACSS02	0.628	0.022	28.515	0.000
ACSS03	0.803	0.015	54.866	0.000
ACSS04	0.576	0.026	21.913	0.000
ACSS05	0.781	0.017	46.380	0.000
ACSS06	0.821	0.015	56.107	0.000
ACSS07	0.552	0.026	21.117	0.000
ACSS08	0.812	0.014	58.203	0.000
ACSS09	0.809	0.014	56.331	0.000
ACSS10	0.818	0.014	56.826	0.000
ACSS11	0.949	0.007	135.918	0.000
ACSS12	0.950	0.007	136.553	0.000
RBELIEFS BY				
ACRS01	0.953	0.009	109.920	0.000
ACRS02	0.907	0.011	83.079	0.000
ACRS03	0.738	0.019	38.291	0.000
ACRS04	0.872	0.012	69.810	0.000
ACRS05	0.603	0.026	22.917	0.000
ACRS06	0.673	0.023	29.474	0.000
ACRS07	0.885	0.012	76.717	0.000
ACRS08	0.583	0.026	22.745	0.000
ACRS09	0.739	0.020	36.866	0.000
ACRS11	0.949	0.008	121.105	0.000

ACRS13	0.911	0.010	87.950	0.000
SCIREAS BY				
LCTSR01	0.546	0.042	12.927	0.000
LCTSR02	0.615	0.038	16.073	0.000
LCTSR03	0.650	0.038	17.335	0.000
LCTSR04	0.662	0.034	19.471	0.000
LCTSR05	0.647	0.035	18.532	0.000
LCTSR06	0.250	0.049	5.135	0.000
LCTSR07	0.360	0.044	8.256	0.000
LCTSR08	0.691	0.030	23.122	0.000
LCTSR09	0.752	0.031	24.385	0.000
LCTSR10	0.443	0.042	10.543	0.000
LCTSR11	0.265	0.049	5.415	0.000
LCTSR12	0.280	0.046	6.067	0.000
RPRACTIC BY				
RELIG04	0.943	0.018	53.183	0.000
RELIG05	0.907	0.013	67.346	0.000
RELIG07	0.895	0.014	62.562	0.000
RELIG08	0.746	0.023	32.939	0.000
RINFLUEN BY				
RELIG09	0.917	0.012	77.682	0.000
RELIG10	0.782	0.018	44.378	0.000
RELIG11	0.890	0.010	86.854	0.000
RELIG12	0.938	0.008	122.085	0.000
RELIG13	0.905	0.012	78.086	0.000
RHOPE BY				
RELIG14	0.996	0.013	76.272	0.000
RELIG16	0.877	0.016	53.490	0.000
RELIG17	0.787	0.020	40.282	0.000
RELIG18	0.404	0.035	11.651	0.000
RBELIEFS WITH				
SCIACCEP	-0.723	0.020	-36.251	0.000
SCIREAS WITH				
SCIACCEP	-0.046	0.042	-1.107	0.268
RBELIEFS	0.008	0.044	0.190	0.849
RPRACTIC WITH				
SCIACCEP	-0.446	0.033	-13.658	0.000
RBELIEFS	0.540	0.029	18.611	0.000
SCIREAS	-0.015	0.047	-0.313	0.754

RINFLUEN WITH				
SCIACCEP	-0.497	0.029	-17.185	0.000
RBELIEFS	0.660	0.022	29.419	0.000
SCIREAS	0.006	0.044	0.146	0.884
RPRACTIC	0.702	0.022	32.306	0.000
RHOPE WITH				
SCIACCEP	-0.554	0.031	-17.892	0.000
RBELIEFS	0.839	0.015	56.950	0.000
SCIREAS	-0.022	0.048	-0.471	0.638
RPRACTIC	0.537	0.033	16.215	0.000
RINFLUEN	0.607	0.029	21.095	0.000
ACRS05 WITH				
ACRS06	0.812	0.013	62.511	0.000
Thresholds				
RELIG04$1	-0.080	0.047	-1.709	0.087
RELIG04$2	0.101	0.047	2.155	0.031
RELIG04$3	0.421	0.048	8.743	0.000
RELIG04$4	0.861	0.053	16.108	0.000
RELIG04$5	1.608	0.077	20.978	0.000
RELIG05$1	0.125	0.047	2.675	0.007
RELIG05$2	0.266	0.047	5.643	0.000
RELIG05$3	1.188	0.061	19.561	0.000
RELIG05$4	1.917	0.096	19.994	0.000
RELIG05$5	2.165	0.119	18.235	0.000
RELIG07$1	-0.108	0.047	-2.304	0.021
RELIG07$2	0.118	0.047	2.527	0.012
RELIG07$3	1.174	0.060	19.456	0.000
RELIG07$4	1.875	0.093	20.214	0.000
RELIG08$1	0.284	0.047	6.013	0.000
RELIG08$2	0.836	0.053	15.768	0.000
RELIG08$3	1.285	0.064	20.190	0.000
RELIG08$4	1.875	0.093	20.214	0.000
RELIG08$5	2.244	0.128	17.546	0.000
RELIG09$1	-0.368	0.048	-7.712	0.000
RELIG09$2	0.045	0.047	0.966	0.334
RELIG09$3	0.455	0.048	9.404	0.000
RELIG09$4	0.783	0.052	15.010	0.000
RELIG09$5	1.231	0.062	19.865	0.000
RELIG10$1	-0.379	0.048	-7.933	0.000
RELIG10$2	0.048	0.047	1.041	0.298
RELIG10$3	0.383	0.048	8.007	0.000
RELIG10$4	0.679	0.051	13.390	0.000

RELIG10$5	1.195	0.061	19.613	0.000
RELIG11$1	-0.582	0.050	-11.737	0.000
RELIG11$2	-0.121	0.047	-2.601	0.009
RELIG11$3	0.306	0.047	6.457	0.000
RELIG11$4	0.741	0.052	14.381	0.000
RELIG11$5	1.483	0.071	20.909	0.000
RELIG12$1	-0.594	0.050	-11.954	0.000
RELIG12$2	-0.209	0.047	-4.457	0.000
RELIG12$3	0.284	0.047	6.013	0.000
RELIG12$4	0.688	0.051	13.532	0.000
RELIG12$5	1.277	0.063	20.146	0.000
RELIG13$1	-1.034	0.057	-18.185	0.000
RELIG13$2	-0.632	0.050	-12.603	0.000
RELIG13$3	-0.146	0.047	-3.121	0.002
RELIG13$4	0.273	0.047	5.791	0.000
RELIG13$5	0.891	0.054	16.511	0.000
RELIG14$1	-1.526	0.073	-20.966	0.000
RELIG14$2	-1.277	0.063	-20.146	0.000
RELIG14$3	-0.750	0.052	-14.521	0.000
RELIG14$4	-0.281	0.047	-5.939	0.000
RELIG16$1	-1.584	0.075	-20.987	0.000
RELIG16$2	-1.277	0.063	-20.146	0.000
RELIG16$3	-0.619	0.050	-12.387	0.000
RELIG16$4	-0.007	0.047	-0.149	0.882
RELIG17$1	-1.462	0.070	-20.870	0.000
RELIG17$2	-1.028	0.057	-18.124	0.000
RELIG17$3	-0.653	0.050	-12.962	0.000
RELIG17$4	-0.128	0.047	-2.749	0.006
RELIG17$5	0.463	0.048	9.551	0.000
RELIG18$1	-1.939	0.098	-19.867	0.000
RELIG18$2	-1.504	0.072	-20.941	0.000
RELIG18$3	-1.058	0.057	-18.429	0.000
RELIG18$4	-0.317	0.047	-6.679	0.000
RELIG18$5	0.436	0.048	9.037	0.000
ACRS01$1	-0.938	0.055	-17.106	0.000
ACRS01$2	-0.561	0.049	-11.375	0.000
ACRS01$3	-0.125	0.047	-2.675	0.007
ACRS02$1	-1.368	0.066	-20.586	0.000
ACRS02$2	-1.064	0.058	-18.489	0.000
ACRS02$3	-0.788	0.052	-15.079	0.000
ACRS02$4	-0.368	0.048	-7.712	0.000
ACRS02$5	0.111	0.047	2.378	0.017
ACRS03$1	-0.797	0.052	-15.218	0.000
ACRS03$2	-0.346	0.048	-7.270	0.000
ACRS03$3	0.087	0.047	1.858	0.063
ACRS03$4	0.606	0.050	12.171	0.000

ACRS03$5	1.127	0.059	19.071	0.000
ACRS04$1	-0.891	0.054	-16.511	0.000
ACRS04$2	-0.586	0.050	-11.810	0.000
ACRS04$3	-0.324	0.047	-6.826	0.000
ACRS04$4	0.003	0.047	0.074	0.941
ACRS04$5	0.357	0.048	7.491	0.000
ACRS05$1	-0.447	0.048	-9.257	0.000
ACRS05$2	-0.062	0.047	-1.338	0.181
ACRS05$3	0.252	0.047	5.346	0.000
ACRS05$4	0.640	0.050	12.747	0.000
ACRS05$5	1.046	0.057	18.308	0.000
ACRS06$1	-0.590	0.050	-11.882	0.000
ACRS06$2	-0.115	0.047	-2.452	0.014
ACRS06$3	0.170	0.047	3.641	0.000
ACRS06$4	0.598	0.050	12.027	0.000
ACRS06$5	1.070	0.058	18.549	0.000
ACRS07$1	-1.016	0.056	-18.000	0.000
ACRS07$2	-0.606	0.050	-12.171	0.000
ACRS07$3	-0.346	0.048	-7.270	0.000
ACRS07$4	-0.007	0.047	-0.149	0.882
ACRS07$5	0.383	0.048	8.007	0.000
ACRS08$1	-1.167	0.060	-19.402	0.000
ACRS08$2	-0.821	0.053	-15.563	0.000
ACRS08$3	-0.398	0.048	-8.302	0.000
ACRS08$4	0.062	0.047	1.338	0.181
ACRS08$5	0.578	0.050	11.665	0.000
ACRS09$1	-0.896	0.054	-16.578	0.000
ACRS09$2	-0.466	0.048	-9.624	0.000
ACRS09$3	-0.101	0.047	-2.155	0.031
ACRS09$4	0.259	0.047	5.494	0.000
ACRS09$5	0.674	0.051	13.319	0.000
ACRS11$1	-1.089	0.058	-18.726	0.000
ACRS11$2	-0.760	0.052	-14.661	0.000
ACRS11$3	-0.478	0.049	-9.844	0.000
ACRS11$4	-0.125	0.047	-2.675	0.007
ACRS11$5	0.231	0.047	4.902	0.000
ACRS13$1	-0.994	0.056	-17.749	0.000
ACRS13$2	-0.760	0.052	-14.661	0.000
ACRS13$3	-0.459	0.048	-9.478	0.000
ACRS13$4	-0.111	0.047	-2.378	0.017
ACRS13$5	0.310	0.047	6.531	0.000
ACSS01$1	-0.792	0.052	-15.149	0.000
ACSS01$2	-0.406	0.048	-8.449	0.000
ACSS01$3	-0.069	0.047	-1.486	0.137
ACSS01$4	0.409	0.048	8.523	0.000
ACSS01$5	0.977	0.056	17.558	0.000

ACSS02$1	-1.537	0.073	-20.975	0.000
ACSS02$2	-1.114	0.059	-18.958	0.000
ACSS02$3	-0.653	0.050	-12.962	0.000
ACSS02$4	0.128	0.047	2.749	0.006
ACSS02$5	0.891	0.054	16.511	0.000
ACSS03$1	-1.368	0.066	-20.586	0.000
ACSS03$2	-0.933	0.055	-17.041	0.000
ACSS03$3	-0.455	0.048	-9.404	0.000
ACSS03$4	0.160	0.047	3.418	0.001
ACSS03$5	0.783	0.052	15.010	0.000
ACSS04$1	-1.939	0.098	-19.867	0.000
ACSS04$2	-1.734	0.084	-20.763	0.000
ACSS04$3	-1.395	0.067	-20.685	0.000
ACSS04$4	-0.683	0.051	-13.461	0.000
ACSS04$5	0.216	0.047	4.605	0.000
ACSS05$1	-1.342	0.066	-20.477	0.000
ACSS05$2	-1.076	0.058	-18.608	0.000
ACSS05$3	-0.705	0.051	-13.816	0.000
ACSS05$4	-0.177	0.047	-3.789	0.000
ACSS05$5	0.421	0.048	8.743	0.000
ACSS06$1	-1.404	0.068	-20.715	0.000
ACSS06$2	-1.209	0.061	-19.715	0.000
ACSS06$3	-0.891	0.054	-16.511	0.000
ACSS06$4	-0.220	0.047	-4.679	0.000
ACSS06$5	0.413	0.048	8.596	0.000
ACSS07$1	-1.317	0.065	-20.359	0.000
ACSS07$2	-0.841	0.053	-15.836	0.000
ACSS07$3	-0.372	0.048	-7.786	0.000
ACSS07$4	0.328	0.047	6.900	0.000
ACSS07$5	0.966	0.055	17.430	0.000
ACSS08$1	-1.188	0.061	-19.561	0.000
ACSS08$2	-0.861	0.053	-16.108	0.000
ACSS08$3	-0.463	0.048	-9.551	0.000
ACSS08$4	0.195	0.047	4.160	0.000
ACSS08$5	0.876	0.054	16.310	0.000
ACSS09$1	-1.231	0.062	-19.865	0.000
ACSS09$2	-0.949	0.055	-17.236	0.000
ACSS09$3	-0.447	0.048	-9.257	0.000
ACSS09$4	0.156	0.047	3.344	0.001
ACSS09$5	0.871	0.054	16.243	0.000
ACSS10$1	-1.052	0.057	-18.368	0.000
ACSS10$2	-0.688	0.051	-13.532	0.000
ACSS10$3	-0.302	0.047	-6.383	0.000
ACSS10$4	0.313	0.047	6.605	0.000
ACSS10$5	0.982	0.056	17.622	0.000
ACSS11$1	-0.719	0.051	-14.029	0.000

ACSS11$2	-0.447	0.048	-9.257	0.000
ACSS11$3	-0.146	0.047	-3.121	0.002
ACSS11$4	0.238	0.047	5.050	0.000
ACSS11$5	0.778	0.052	14.940	0.000
ACSS12$1	-0.821	0.053	-15.563	0.000
ACSS12$2	-0.474	0.049	-9.771	0.000
ACSS12$3	-0.139	0.047	-2.972	0.003
ACSS12$4	0.288	0.047	6.087	0.000
ACSS12$5	0.886	0.054	16.444	0.000
LCTSR01$1	-1.254	0.063	-20.008	0.000
LCTSR01$2	-0.871	0.054	-16.243	0.000
LCTSR02$1	-0.135	0.047	-2.898	0.004
LCTSR02$2	-0.017	0.047	-0.372	0.710
LCTSR03$1	0.270	0.047	5.717	0.000
LCTSR03$2	0.728	0.051	14.170	0.000
LCTSR04$1	0.000	0.047	0.000	1.000
LCTSR04$2	1.224	0.062	19.816	0.000
LCTSR05$1	-0.010	0.047	-0.223	0.824
LCTSR05$2	0.440	0.048	9.111	0.000
LCTSR06$1	0.313	0.047	6.605	0.000
LCTSR06$2	1.414	0.068	20.745	0.000
LCTSR07$1	-0.080	0.047	-1.709	0.087
LCTSR07$2	1.167	0.060	19.402	0.000
LCTSR08$1	-0.831	0.053	-15.700	0.000
LCTSR08$2	0.048	0.047	1.041	0.298
LCTSR09$1	-0.192	0.047	-4.086	0.000
LCTSR09$2	0.139	0.047	2.972	0.003
LCTSR10$1	-0.153	0.047	-3.269	0.001
LCTSR10$2	0.455	0.048	9.404	0.000
LCTSR11$1	0.121	0.047	2.601	0.009
LCTSR11$2	1.334	0.065	20.439	0.000
LCTSR12$1	-0.627	0.050	-12.531	0.000
LCTSR12$2	1.011	0.056	17.937	0.000

Variances

SCIACCEP	1.000	0.000	999.000	999.000
RBELIEFS	1.000	0.000	999.000	999.000
SCIREAS	1.000	0.000	999.000	999.000
RPRACTIC	1.000	0.000	999.000	999.000
RINFLUEN	1.000	0.000	999.000	999.000
RHOPE	1.000	0.000	999.000	999.000

R-SQUARE

Observed		Two-Tailed	Residual

Variable	Estimate	S.E.	Est./S.E.	P-Value	Variance
RELIG04	0.889	0.033	26.591	0.000	0.111
RELIG05	0.822	0.024	33.673	0.000	0.178
RELIG07	0.800	0.026	31.281	0.000	0.200
RELIG08	0.557	0.034	16.470	0.000	0.443
RELIG09	0.841	0.022	38.841	0.000	0.159
RELIG10	0.611	0.028	22.189	0.000	0.389
RELIG11	0.791	0.018	43.427	0.000	0.209
RELIG12	0.881	0.014	61.042	0.000	0.119
RELIG13	0.820	0.021	39.043	0.000	0.180
RELIG14	0.992	0.026	38.136	0.000	0.008
RELIG16	0.768	0.029	26.745	0.000	0.232
RELIG17	0.620	0.031	20.141	0.000	0.380
RELIG18	0.163	0.028	5.825	0.000	0.837
ACRS01	0.909	0.017	54.960	0.000	0.091
ACRS02	0.823	0.020	41.539	0.000	0.177
ACRS03	0.544	0.028	19.145	0.000	0.456
ACRS04	0.760	0.022	34.905	0.000	0.240
ACRS05	0.364	0.032	11.458	0.000	0.636
ACRS06	0.453	0.031	14.737	0.000	0.547
ACRS07	0.783	0.020	38.358	0.000	0.217
ACRS08	0.340	0.030	11.373	0.000	0.660
ACRS09	0.546	0.030	18.433	0.000	0.454
ACRS11	0.900	0.015	60.552	0.000	0.100
ACRS13	0.830	0.019	43.975	0.000	0.170
ACSS01	0.737	0.023	32.382	0.000	0.263
ACSS02	0.394	0.028	14.258	0.000	0.606
ACSS03	0.645	0.024	27.433	0.000	0.355
ACSS04	0.332	0.030	10.956	0.000	0.668
ACSS05	0.610	0.026	23.190	0.000	0.390
ACSS06	0.674	0.024	28.054	0.000	0.326
ACSS07	0.305	0.029	10.558	0.000	0.695
ACSS08	0.660	0.023	29.102	0.000	0.340
ACSS09	0.655	0.023	28.165	0.000	0.345
ACSS10	0.669	0.024	28.413	0.000	0.331
ACSS11	0.900	0.013	67.959	0.000	0.100
ACSS12	0.902	0.013	68.276	0.000	0.098
LCTSR01	0.299	0.046	6.464	0.000	0.701
LCTSR02	0.378	0.047	8.037	0.000	0.622
LCTSR03	0.423	0.049	8.668	0.000	0.577
LCTSR04	0.438	0.045	9.736	0.000	0.562
LCTSR05	0.418	0.045	9.266	0.000	0.582
LCTSR06	0.062	0.024	2.567	0.010	0.938
LCTSR07	0.130	0.031	4.128	0.000	0.870
LCTSR08	0.477	0.041	11.561	0.000	0.523

LCTSR09	0.565	0.046	12.193	0.000	0.435
LCTSR10	0.196	0.037	5.271	0.000	0.804
LCTSR11	0.070	0.026	2.708	0.007	0.930
LCTSR12	0.078	0.026	3.034	0.002	0.922

QUALITY OF NUMERICAL RESULTS

Condition Number for the Information Matrix 0.132E-03
(ratio of smallest to largest eigenvalue)

MODEL MODIFICATION INDICES

NOTE: Modification indices for direct effects of observed dependent variables regressed on covariates and residual covariances among observed dependent variables may not be included. To include these, request MODINDICES (ALL).

Minimum M.I. value for printing the modification index 20.000

	M.I.	E.P.C.	Std E.P.C.	StdYX E.P.C.
BY Statements				
SCIACCEP BY RELIG04	56.409	-0.232	-0.199	-0.199
SCIACCEP BY RELIG08	49.666	0.225	0.193	0.193
SCIACCEP BY RELIG10	50.315	0.214	0.183	0.183
SCIACCEP BY RELIG13	31.731	-0.152	-0.131	-0.131
SCIACCEP BY RELIG18	60.153	0.312	0.267	0.267
SCIACCEP BY ACRS06	21.369	-0.195	-0.167	-0.167
SCIACCEP BY ACRS08	35.777	0.262	0.225	0.225
SCIACCEP BY ACRS09	25.012	0.212	0.182	0.182
SCIACCEP BY LCTSR06	50.943	0.139	0.120	0.120
RBELIEFS BY RELIG04	81.812	0.274	0.261	0.261
RBELIEFS BY RELIG08	59.606	-0.238	-0.227	-0.227
RBELIEFS BY RELIG10	41.961	-0.214	-0.204	-0.204
RBELIEFS BY RELIG13	39.797	0.184	0.176	0.176
RBELIEFS BY RELIG18	49.456	-0.615	-0.587	-0.587
RBELIEFS BY ACSS02	53.237	0.267	0.255	0.255
RBELIEFS BY ACSS04	57.427	0.317	0.302	0.302
RBELIEFS BY ACSS07	45.033	0.256	0.244	0.244
RBELIEFS BY ACSS11	57.432	-0.219	-0.209	-0.209
RBELIEFS BY ACSS12	23.524	-0.139	-0.133	-0.133
RBELIEFS BY LCTSR03	22.324	0.085	0.081	0.081
RBELIEFS BY LCTSR06	57.423	-0.126	-0.120	-0.120
RBELIEFS BY LCTSR12	20.260	-0.071	-0.067	-0.067

RPRACTIC	BY ACSS02	46.435	0.222	0.209	0.209
RPRACTIC	BY ACSS07	24.492	0.163	0.153	0.153
RPRACTIC	BY ACSS11	46.592	-0.195	-0.184	-0.184
RPRACTIC	BY LCTSR03	22.719	0.113	0.106	0.106
RPRACTIC	BY LCTSR06	53.972	-0.160	-0.151	-0.151
RINFLUEN	BY RELIG04	79.446	0.481	0.441	0.441
RINFLUEN	BY RELIG08	40.691	-0.350	-0.321	-0.321
RINFLUEN	BY ACRS06	21.170	-0.213	-0.196	-0.196
RINFLUEN	BY ACSS02	58.242	0.238	0.218	0.218
RINFLUEN	BY ACSS04	26.588	0.175	0.160	0.160
RINFLUEN	BY ACSS07	27.875	0.166	0.152	0.152
RINFLUEN	BY ACSS11	59.428	-0.202	-0.186	-0.186
RINFLUEN	BY ACSS12	26.028	-0.135	-0.124	-0.124
RINFLUEN	BY LCTSR03	23.192	0.105	0.096	0.096
RINFLUEN	BY LCTSR06	50.598	-0.144	-0.132	-0.132
RHOPE	BY RELIG04	72.116	0.293	0.292	0.292
RHOPE	BY RELIG08	53.446	-0.259	-0.258	-0.258
RHOPE	BY RELIG10	32.883	-0.214	-0.213	-0.213
RHOPE	BY RELIG13	37.817	0.200	0.199	0.199
RHOPE	BY ACRS05	21.218	-0.450	-0.448	-0.448
RHOPE	BY ACRS06	34.464	-0.543	-0.541	-0.541
RHOPE	BY ACSS02	46.113	0.216	0.215	0.215
RHOPE	BY ACSS04	57.432	0.273	0.272	0.272
RHOPE	BY ACSS07	43.703	0.218	0.217	0.217
RHOPE	BY ACSS11	60.210	-0.200	-0.199	-0.199
RHOPE	BY ACSS12	25.969	-0.130	-0.130	-0.130
RHOPE	BY LCTSR03	22.122	0.091	0.091	0.091
RHOPE	BY LCTSR06	59.393	-0.139	-0.138	-0.138

WITH Statements

RELIG05	WITH RELIG04	33.178	-0.190	-0.190	-1.358
RELIG07	WITH RELIG04	26.797	-0.169	-0.169	-1.140
RELIG08	WITH RELIG05	21.088	0.147	0.147	0.523
RELIG08	WITH RELIG07	27.887	0.164	0.164	0.552
RELIG12	WITH RELIG11	25.776	0.100	0.100	0.636
RELIG18	WITH RELIG17	34.498	0.220	0.220	0.390
ACSS03	WITH ACSS02	33.080	0.170	0.170	0.368
ACSS05	WITH ACRS05	31.913	-0.209	-0.209	-0.419
ACSS05	WITH ACRS06	52.429	-0.239	-0.239	-0.518
LCTSR09	WITH LCTSR08	29.930	0.325	0.325	0.683

DIAGRAM INFORMATION

Use View Diagram under the Diagram menu in the Mplus Editor to view the diagram.

If running Mplus from the Mplus Diagrammer, the diagram opens automatically.

Diagram output
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