

Ideological Commitments and Evolution: The Mediating Role of Conservative Self-identity on Associations between Religiosity and both Individual Evolutionary Knowledge and Attitudes toward the Relevance of Evolution

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Introduction

Certain religions are less open or accepting of the theory of evolution than others [1]. Due to an ideological conflict, people with less accepting religious backgrounds may possess less evolutionary knowledge and perceive the theory of evolution as less relevant to human affairs [2][3]. Additionally, religiosity is associated with political ideology [4][5]. A conservative self-identity functions to minimize stress associated with uncertainty and change, and is accordingly characterized by less open-minded thinking, eschewal of novelty and creativity, and less willingness to engage in prolonged, effortful cognition [6][7][8]. The theory of evolution neither ascribes a special meaning to human life nor prescribes how a life can be well-lived. Consequently, for the politically conservative, it is not a comfortable perspective through which to describe and explain human behavior. Thus, evolution conflicts more with conservative than liberal thinking [9].

The present study investigates the degree to which differences in evolutionary knowledge and attitudes about the relevance of evolutionary theory for human affairs can be explained by religious and political ideological commitments. We hypothesize that religiosity and conservative self-identity will each have negative associations with knowledge of evolution and evolution's perceived relevance. Furthermore, it is predicted that conservative self-identity will partially mediate the predictive power of one's religiosity in the relationships between both evolutionary knowledge and relevance of evolution.

Method

Participants. A sample of 371 undergraduates from a large Midwestern university participated by completing an online survey for which they received course credit. 327 were drawn from a Child Psychology course and 44 came from a Social Psychology course. The sample consisted of 102 men and 269 women. Nearly 40 declared majors were represented. The top three religions represented were as follows: 204 total Christians (55.59%), 48 Agnostic (13.08%), 45 Spiritual, but not religious (12.26%). A breakdown of the different religions in the data set, including a breakdown of Christians by specific denomination, is contained in Figure 3.

Measures

Religiosity (Evolution Attitudes and Literacy Survey (EALS), Hawley et. al., in review)

6 Items; (Cronbach's $\alpha = .95$); 7-point Likert Scale
 EX: "To what degree do you participate in religious activities?"

Conservative Self-identity (EALS, Hawley et. al., in review)

5 Items; (Cronbach's $\alpha = .84$); 7-point Likert Scale
 EX: "In general, how do you self identify politically?"

Relevance of Evolution (EALS, Hawley et. al., in review)

9 Items; (Cronbach's $\alpha = .94$); 7-point Likert scale
 EX: "The theory of evolution helps explain the world as it is in the present."

Evolutionary Knowledge (EALS, Hawley et. al., in review)

7 Items; (Cronbach's $\alpha = .72$); 7-point Likert scale
 EX: "Increased genetic variability makes a population more resistant to extinction."

Design and Analysis

Different methodologies exist for testing mediation. Structural Equation Models have been shown to be a superior approach to Baron & Kenny (1986) and the Sobel Test [10]. Therefore, we conducted an SEM mediation model to first examine the relationships between Religiosity and both Knowledge and Relevance and second to analyze Conservative Self-identity's potential as a mediator in both of these relationships. SEM results are presented in Figures 1 and 2.

SOURCES FOOTNOTES

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RESULTS

Conservative self-identity and Religiosity each displayed significant negative correlations with Evolutionary Knowledge and Relevance of Evolution (see Table 2).

The total effect of Religiosity on Relevance of Evolution was -.46, and with the inclusion of Conservative Self-identity, the direct path from Religiosity to Relevance of Evolution decreased from -.46 to -.32, representing a change in β of 30% ($p < 0.001$). Although this suggests that Conservative Self-identity is a partial mediator in the relationship between Religiosity and Relevance of Evolution, model fit was poor and limits interpretability (see Fig. 1).

The total effect of Religiosity on Evolutionary Knowledge was -.21, and with the inclusion of Conservative Self-identity the direct path from Religiosity to Evolutionary Knowledge became insignificant, $\beta = -.07$, ns, suggesting that Conservative Self-identity completely mediates the relationship between Religiosity and Evolutionary Knowledge (see Fig. 2).

Table 1 displays the confirmatory factor analysis. All items are displayed along with their variance accounted for by the underlying factor and standardized item loading. The factors are accordingly named and displayed with their alpha reliabilities, means, and standard deviations.

Construct/Variable	Items	Standardized Item Loading	Item Variance Explained	Alpha	M	S
Religiosity				.95	3.75	1.79
To what degree are you religious?		.937	.878			
To what degree does religion impact your daily life?		.921	.848			
To what degree does your religion influence your decisions?		.930	.865			
To what degree do you participate in religious activities?		.850	.723			
How much do you believe in God?		.744	.553			
Religion is especially important to me because it answers many of my questions about the meaning of life. ^a		.884	.781			
Conservative Self-identity				.84	3.88	1.29
To what degree are you conservative?		.840	.705			
In general, how do you self identify politically?		.879	.772			
In general how liberal/conservative are you on . . .Social issues (abortion, same-sex marriage, flag burning, etc)?		.460	.211			
In general how liberal/conservative are you on Economic issues (welfare, taxation, free market policies, etc)?		.713	.508			
In general how liberal/conservative are you on foreign policy and defense issues (defense spending, combating terrorism, pre-emptive war)?		.607	.368			
Relevance of Evolution				.94	4.97	1.16
The theory of evolution helps us understand plants.		.791	.626			
Evolutionary theory is highly relevant for biology.		.891	.794			
The theory of evolution helps us understand animals.		.908	.825			
The theory of evolution helps us understand human origins.		.862	.743			
For explaining human behavior, evolutionary theory is irrelevant.		.603	.364			
Evolutionary theory is highly relevant for the social sciences (e.g., anthropology, psychology, sociology).		.779	.607			
Evolutionary theory is highly relevant for the humanities (e.g., history, literature, philosophy).		.629	.396			
Evolutionary theory is relevant to our everyday lives.		.687	.472			
The theory of evolution helps explain the world as it is in the present.		.830	.689			
Evolutionary Knowledge				.72	5.02	0.86
In most populations, more offspring are born than can survive. Individuals don't evolve, species do.		.484	.234			
Mutations can be passed down to the next generation.		.391	.153			
Natural selection is the only cause of evolution. (reverse scored)		.622	.387			
Increased genetic variability makes a population more resistant to extinction.		.619	.383			
The more recently species share a common ancestor, the more closely related they are.		.525	.276			
Mutations occur all the time.		.446	.199			
		.563	.317			

Table 2 Latent Correlation Coefficients.

	1. Religiosity	2. Conservative Self-identity	3. Relevance of Evolution	4. Evolutionary Knowledge
1. Religiosity	1.00			
2. Conservative Self-identity	0.53*	1.00		
3. Relevance of Evolution	-0.47*	-0.44*	1.00	
4. Evolutionary Knowledge	-0.22*	-0.30*	0.72*	1.00

Figure 1 SEM Mediation Model of Religiosity through Conservative Self-identity to Relevance of Evolution. Values reflect standardized regression coefficients. All solid paths are significant at the $p < .001$ level.

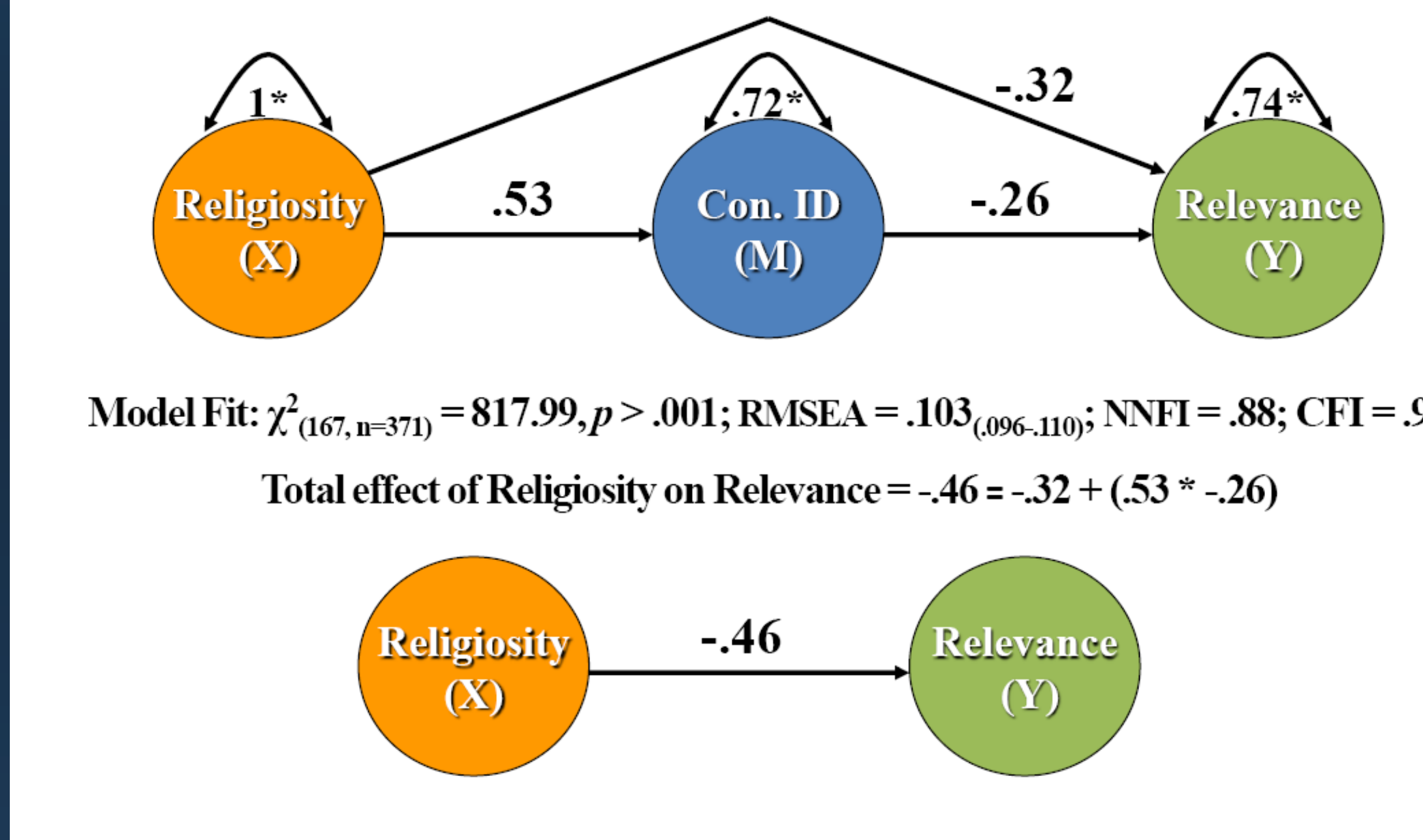


Figure 2 SEM Mediation Model of Religiosity through Conservative Self-identity to Evolutionary Knowledge. Values reflect standardized regression coefficients. All solid paths are significant at the $p < .001$ level.

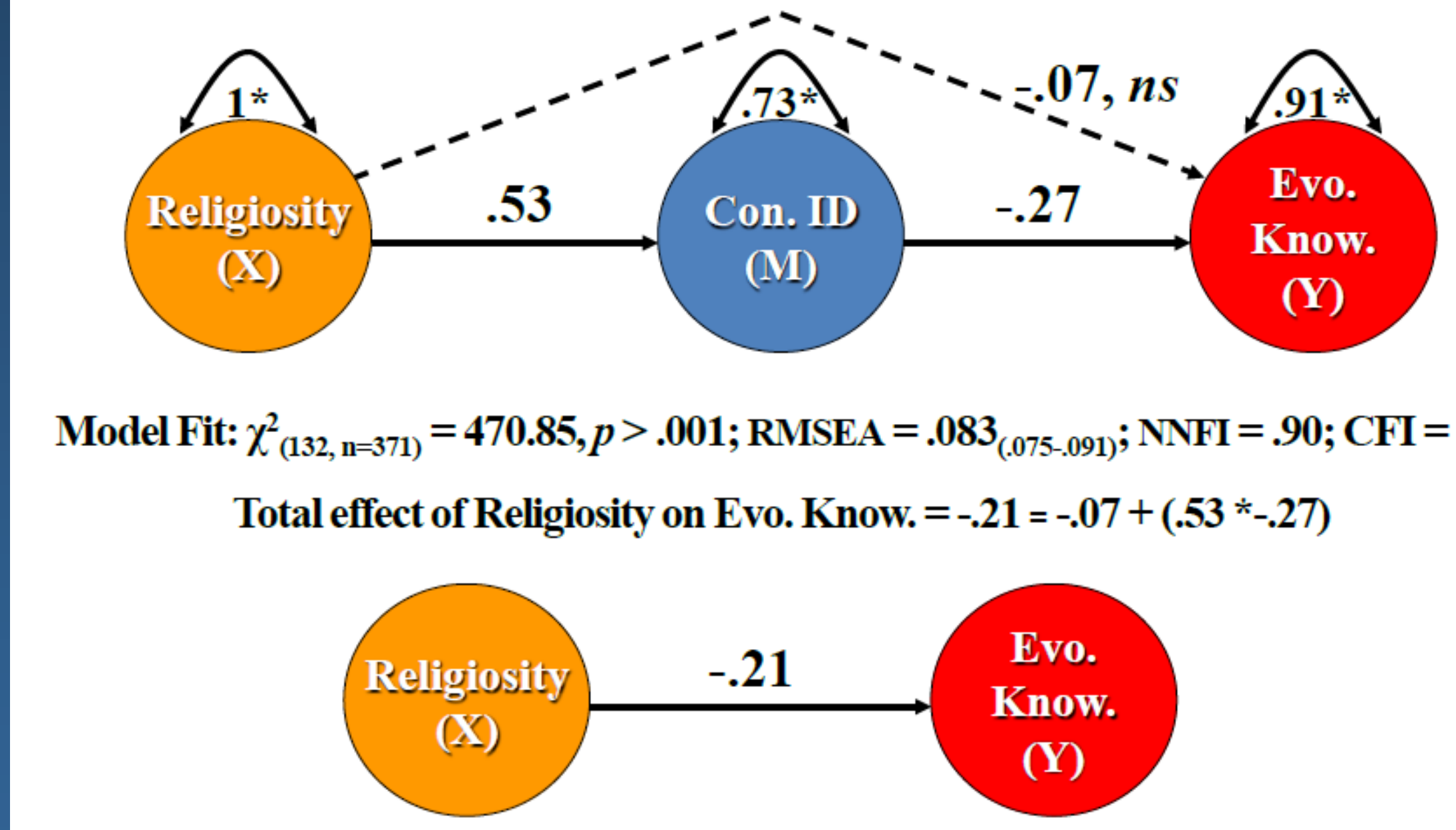


Figure 3 Frequency chart of religions represented in data set.

Religious Affiliation	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agnostic	48	13.08	48	13.08
Atheist	20	5.45	68	18.53
Buddhist	6	1.63	74	20.16
Christian: Baptist	22	5.99	96	26.16
Christian: Church of Christ	16	4.36	112	30.52
Christian: Eastern Orthodox	1	0.27	113	30.79
Christian: Episcopalian	5	1.36	118	32.15
Christian: Lutheran	15	4.09	133	36.24
Christian: Methodist	24	6.54	157	42.78
Christian: Mormon/Latter Day Saints	2	0.54	159	43.32
Christian: Other Protestant Denomination	21	5.72	180	49.05
Christian: Pentacostal	7	1.91	187	50.95
Christian: Presbyterian	16	4.36	203	55.31
Christian: Roman Catholic	75	20.44	278	75.75
Hindu	5	1.36	283	77.11
Jewish	18	4.90	301	82.02
Muslim	4	1.09	305	83.11
Other	11	3.00	316	86.10
Spiritual, but not religious	45	12.26	361	98.37
Unitarian/Universalist	6	1.63	367	100.00

Frequency Missing = 4

CONCLUSIONS

As hypothesized, Religiosity was negatively correlated with both Relevance of Evolution and Evolutionary Knowledge. Conservative Self-identity was also negatively correlated with both Relevance of Evolution and Evolutionary Knowledge.

Mediation suggests transmission of a causal effect by way of a mediator variable. In the present study, it can be understood as the question "why, by what means, or through what process does Religiosity exert its effect on Evolutionary Knowledge and Relevance of Evolution?" In terms the relationship between Religiosity and Relevance, Conservative Self-identity was a partial mediator. This suggests that part of the variance in individuals' perceived relevance of evolution for human affairs as predicted by Religiosity can be explained by the latent construct Conservative Self-identity. In terms of the relationship between Religiosity and Knowledge, Conservative Self-identity was a complete mediator. This suggests that all of the variance in individuals' knowledge of evolution as predicted by Religiosity can be explained by the latent construct Conservative Self-identity.

This study's limitations include the potential for response and sample biases. An additional limitation is that the psychometric properties of this scale are still being developed and further refined to create more uniform constructs. Because the model fit in figure 1 is poor, the results may be difficult to interpret. Ongoing research is collecting data from regional samples across the US, including samples from the Northeastern and West Coast regions to determine if these models are generalizable.

Ideological commitments may serve as an obstacle to the understanding and acceptance of evolutionary theory. An understanding of the associations between these ideological commitments will inform research that seeks to improve the efficacy of evolution education by providing educators with a better understanding of individual factors that influence learning outcomes.

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