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# Examining Inequalities in Science Literacy by Religious Affiliation Among Adults

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## Abstract

Much attention has been given to the general public's lack of understanding of science and the adverse effect of this lack of knowledge in our ever-advancing scientific and technological society. Religion remains an important social frame through which individuals interpret information, including scientific findings and facts and one deserving of closer examination in understanding disparities in public science knowledge. Using a random sample of adults in Nebraska, this study explored the association between religious affiliation and adult scientific literacy of human biological concepts. Results found a relationship between religious affiliation and adult scientific knowledge, even after controlling for confounding demographic variables such as education, age, and gender. Specifically, Evangelical/Fundamentalist Protestants had the lowest level of science knowledge compared to their counterparts with other religious affiliations and the non-affiliated. No significant gender, racial, age, or rural/urban differences emerged, but, as expected, education was positively associated with higher levels of science literacy. Implications regarding inequalities in levels of adult science literacy and strategies for educators to reduce these inequalities are discussed.

*Keywords*: adult science literacy inequality, religious affiliation, human biological science knowledge

Much attention has been given to the general public's lack of understanding of science and the adverse effect of this lack of knowledge in our ever-advancing scientific and technological society (Burns, O'Connor, & Stocklmayer, 2003; National Science Foundation, 2012). It is important to have scientifically literate citizens within contemporary society as scientific issues have become important parts of political issues. In addition, science is a key part of understanding and successfully implementing public policy in areas such as health and medicine and environmental studies as well as in remaining competitive in the global economy (Miller, 2010). Understanding of science is subject to social frames as individuals interpret the value and truth of scientific statements (Nisbet & Mooney, 2009). In the U.S., religion remains a significant social institution influential in public life (Finke & Scheitle, 2005). Therefore it remains an important social frame through which individuals interpret information, including scientific findings and facts.

In spaces that must contend with social frames for authority and influence--such as in formal educational systems--it is important to continue to understand how religion as a social frame influences individuals' (and students') understanding of science. Social frames, such as religious views (Nisbet & Mooney, 2009), have the potential to influence science literacy across one's life course, as there are inevitably future scientific advancements not covered in today's textbooks or educational curricula as well. Being scientifically literate allows adults to utilize and make sense of new technology and scientific information, providing important advantages within our society (Miller, 2010). Most adults need to maintain and develop science knowledge after they leave formal schooling. This is important especially for adults over thirty-five who could not have learned about more recent scientific developments during their formal school years (Miller, 2010). For example, topics surrounding stem cell research, climate change, genome mapping, and nanotechnology were not included in science educational curricula in the past.

A recent report on public attitudes and understandings of science and technology by the National Science Foundation (2012) indicates that although Americans remain interested in science and technology, many give incorrect answers to science knowledge questions. As science knowledge becomes increasingly necessary in decision making throughout people's lives and in national economic growth and innovation, understanding differences in science knowledge is a means to understand social inequality among different groups. Health/biological science knowledge is needed to make informed individual health choices as well as be informed about and have input into policy relating to public health concerns. Thus a lack of health/biological knowledge could be a source of disadvantage in individual health outcomes. This study examines public understanding of health/biological science concepts overall and explores how religious affiliation frames individual levels of biological science knowledge among adults.

## Background

Americans continue to rate 'scientist' as a prestigious occupation, support funding of scientific research, and continue to have more favorable attitudes toward the promise of science and technology than those in other countries (National Science Foundation, 2012). Yet the public's own knowledge of basic scientific concepts, which they would use to form these opinions, is questioned. Public understanding of science is defined as the understanding of science content or knowledge, process, and awareness of the impact of science on individuals and society (Burns et al., 2003). Around one in four American adults qualifies as scientifically literate (Miller, 2010). As an important social frame through which individuals interpret information (Nisbet & Mooney, 2009), religion has the potential to frame how science facts are received and understood. Below I outline how religion is influential in attitudes towards science as well as scientific literacy levels.

**Conflicts between Religion and Science Attitudes and Beliefs**

Some religious groups clash with science over moral, epistemological, and ontological issues. Research has shown that religious beliefs can play an important role in shaping public attitudes toward science and technology. For example, Gauchat (2012) found that church attendance is negatively associated with public confidence in science, controlling for other demographic categories. Particular aspects of conservative evangelical theology specifically, such as biblical literalism, beliefs about the salience of sin and evil, and theological orthodoxy, are also associated with more negative opinions of science (Ellison & Musick, 1995). These moral critiques of science include factors that seem to undermine the authority of scriptural interpretations as well as challenging the authority of God in human life (Ellison & Musick, 1995). Consequently, conservative Protestants may view some scientific studies as threats to allegiance to religious and traditional authorities and to the overall moral foundations of society. Ellison and Musick (1995) found that, compared to other Americans, conservative Protestants were more likely to hold negative views of the scientific community. Several areas of scientific research and theory are perceived to be in conflict with theologically conservative religious beliefs.

The interplay between religious beliefs and technological innovations has been complex. Religion has been associated with a distrust of nanotechnology, one of the fastest-growing research areas in the U.S. (Brossard, Schuefele, Kim, & Lewenstein, 2009), and with a distrust of genetically modified food in Europe (Gaskell et al., 2000). Nanotechnology and genetically modified food involve very small scales, either engineering molecules or altering DNA structures. Both advances are associated with moral objections to "playing God" in a sense and

seen as "unnatural," and thus those who hold strong religious beliefs were more likely to have negative views about these technologies. Brossard et al. (2009) found that those with stronger religious beliefs also held less support for the funding of nanotechnology. Importantly, religious belief served as a filter through which knowledge affected support for nanotechnology. For the highly religious, being more knowledgeable about nanotechnology had little effect on their support for funding, meanwhile less religious respondents held a strong positive association between nanotechological knowledge and support for funding (Brossard et al., 2009).

Another contentious topic between science and some religious beliefs is evolutionary theory. The U.S. has seen advances in science and increased attention to bolstering science knowledge and learning. Yet still many Americans hold a creationist viewpoint that is in contention with the scientific literature and community. In multiple polls, almost half of Americans believe that God created humans in their current form within the last 10,000 years, and this viewpoint has changed little within the last 30 years that Gallup has asked this question in polls (Angus Reid Public Opinion, 2012; Newport, 2012). In contrast, 30% believe humans evolved from less advanced life forms over millions of years while 18% report being not sure about the origins and development of humans on Earth (Angus Reid Public Opinion, 2012). This differs from other nations, such as Great Britain and Canada, in which only 17% and 22% respectively believe God created humans in their present form within the last 10,000 years (Angus Reid Public Opinion, 2012).

Religious affiliation is a key factor in one's knowledge and belief in evolution or creationism. Those in more theologically conservative denominations have different views on the topic of evolution, based on specific beliefs. Biblical literalists are more likely to view science and religion as conflicting, especially concerning the theory of evolution and age of the earth, because these contradict a literalist reading of the account of human origins in Genesis (Ellison & Musick, 1995; Sherkat, 2011). Those with fundamentalist beliefs in Biblical literalism view the Bible as the word of God and thus the Bible is interpreted as the true history of the Earth and human life. A particular interpretation of parts of the Book of Genesis and the Old Testament, often referred to as "young-Earth creationism," states that the Universe is a few thousand years old rather than approximately 14 billion years old in accordance with scientific evidence (NASA/WMAP, 2010). This interpretation is held mainly by a subset of evangelical Protestants and some ultra-orthodox Jews and Muslims (Lerner, 2000).

As a result, more fundamentalist denominations have been leading the opposition of the inclusion of evolutionary teaching in public school systems. According to Lerner (2000), the states experiencing the most disagreement about teaching creationist or evolutionary theories are in large part those that have substantial populations of evangelical Protestants. Some have fought for the promotion of teaching "intelligent design" or presenting both "creation science" and evolution in the classroom but these alternatives were ultimately denied by the Supreme Court in

1987 (Lerner, 2000; Sherkat, 2011). Some state science standards have resorted to other strategies to appease creationists, including avoiding mentioning the word evolution, ignoring human or biological evolution, or using other "creationist jargon" in school science texts (Lerner, 2000, p. 290). Overall, according to Lerner's (2000) evaluation of state science standards, about one-third of states had unsatisfactory standards of teaching evolution in public schools.

The perceived contention around specific scientific issues may be an exception rather than the rule concerning the relationship between religion and scientific research, however. Baker (2012) found that a majority of Americans do not perceive incongruence between science and religion. Of the proportion of those who did agree that science and religion are incompatible, they emerge in two groups (similar to Barbour's (2000) taxonomy): those taking the position of biblical literalists and those taking the position of scientific materialists (Baker, 2012). Other research indicates that religiously affiliated and non-affiliated alike support ongoing scientific research in general. The National Science Foundation (2012) has found that Americans have more positive attitudes regarding the promise of science and technology than Europeans, the Japanese, the Chinese, Malaysians, and Indians. In addition, a majority (69%) of Americans indicated that the benefits of scientific research outweigh the harmful results. A large majority support the funding of basic scientific research (82%) while 73% indicate this funding of basic research "usually pays off in the long run" (National Science Foundation, 2012, p. 7-4). In qualitative interviews, Evans (2012) found support for the continuation of scientific research regardless of individual religious affiliation or non-affiliation. The two exceptions in his interviews, however, identified as fundamentalist Protestants, warranting a more nuanced examination of more theologically conservative individuals compared to others. Religion has a relationship with scientific belief and support, at least among some denominations and concerning some scientific issues. Other empirical research has focused on whether religion is associated with actual scientific knowledge.

**Religion and Scientific Literacy**

Conservative denominations have more moral objections with science than other denominations. But research on the influence of religious affiliation and beliefs specifically upon levels of scientific knowledge has been mixed. Some research posits that biblical literalists possess less science knowledge, but much of this deficit has been attributed to demographic factors and unequal educational attainment. For example, Zigerell (2012) found that, although those espousing literalist views of the Bible did have less science knowledge than those with other views of the Bible, demographic and educational factors accounted for much of this difference. Other studies of education and religious affiliation have inconsistent findings. While Johnson and colleagues (2015) found that conservative Protestants are more likely to enroll in

science classes during college compared to other religious groups, Sherkat (2017) found that conservative Protestants are less likely to seek higher education and study science topics.

Yet other research indicates that religion is influential on scientific literacy, and the negative impact of religious factors is more substantial than other factors. In a nationally representative sample of U.S. adults, Sherkat (2011) found that sectarian and fundamentalist religious groups have a lower level of science knowledge than other religious groups even after controlling for gender, race, income, and education. Religion is second only to education as the strongest predictor of science literacy (Sherkat, 2011). In addition, Miller found that those with fundamentalist beliefs were less likely to be scientifically literate compared to those with moderate or liberal beliefs, controlling for age, gender, education, presence of children at home, and issue interest. Overall, research is mixed on the influence of religion upon science literacy and studies often focus on general science knowledge, leaving a gap in research about specific types of science literacy.

**Present Study**

Building upon the foundations of previous research, this study examined inequalities in public understanding of science by one source of social framing--religious affiliation. To expand upon previous research showing mixed results, I explored whether religious affiliation has an association with science knowledge, controlling for sociodemographic factors. Adding to research on science knowledge broadly defined, I specifically explored health/biological science knowledge, as this type of science knowledge may be increasingly important in other areas such as health decision-making. Special attention was paid to different types of Protestantism to explore the associations among more conservative and more mainline groups and level of science literacy.

**Data and Method**

**Data**

This study used the data gathered in the 2010-2011 Nebraska Annual Social Indicators Survey (NASIS, 2011). The NASIS survey contains items on current, topical information and was a joint effort of the Department of Sociology at the University of Nebraska-Lincoln and a variety of public agencies. NASIS 2011 was administered as a mail survey to adults over the age of 19 in the state of Nebraska. The sampling design of the 2011 NASIS mail survey used a directory-listed sample of household addresses. A total of 906 out of 2304 adults completed the

mail survey, resulting in an overall response rate of 39.3% after adjusting for undeliverable returns and known ineligibles. Sampling weights were calculated and adjust for geographic region, age, gender, number of adults in the household, and non-response bias in the samples (NASIS, 2011). Listwise deletion of missing data on this study's variables of interest resulted in a final analytic subsample of 653.

**Dependent Variable: Science Knowledge**

This study examined five items used to assess adults' understanding of various human biological concepts for the University of Nebraska State Museum as a part of the larger Biology of Human project. These items used a 5-point Likert response scale asking respondents to indicate how much they agree or disagree (1=Strongly disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly agree) with each of the following statements: "Humans share common ancestors with apes"; "Vaccines use our body's natural defenses to cure disease"; "We owe our lives to the community of other organisms that share our bodies"; "Death is part of the biology of life"; and "Many diseases result from interactions between genes and the environment." For each item, agreement is the accepted correct response within the scientific community. Yet leaving the index items in the Likert format they were collected in allowed for a more detailed analysis of the incremental levels of agreement/disagreement that may accurately represent individuals' nuanced uncertainty with these factual statements beyond simply transforming the Likert scale into a dichotomous correct vs. incorrect (i.e., agreement vs. disagreement) variable. Exploratory factor analysis indicated that these five items loaded onto a single factor. An overall indicator of human biological science knowledge was created by averaging responses to the five items, with a Cronbach's α of 0.64.

**Focal Independent Variable: Religious Affiliation**

Religious affiliation was coded into a series of dichotomous variables for comparison purposes. Protestant affiliation was coded into Evangelical/Fundamentalist Protestants, which is a combination of those self-identifying as Evangelical or Fundamentalist Protestants; Mainline Protestants, which is a combination of both Mainline and Liberal Protestants; and Other Protestants. In addition, respondents who reported having Protestant affiliation but who did not provide a denominational affiliation comprise the Non-specified Protestants category. Catholics and the Non-affiliated respondents comprise their own respective variables. Jewish, Muslim, and all other religious affiliations were combined into an Other/Non-Christian variable.

**Control Variables**

Several control variables were included in the analyses. Gender was a dichotomous variable with women coded as 1. Race was coded as a dummy variable with Non-white coded as 1. Education was measured in the question "What is the highest degree you have obtained?" and was recoded into three dichotomous categories: High school or less; Some college to 2 year degree; and 4 year degree or more. Income in the past year was coded into three dichotomous categories: $39,999 and below, $40,000-$74,999, and $75,000 and above. Age of respondents was coded in years. Marital status was coded with married as 1. Geographic status was coded as 1 for those living on a farm or in open country and 0 for those living in a town or city.

**Analytic Plan**

Bivariate associations were conducted for religious affiliation and science knowledge. Then multivariate associations were estimated in ordinary least squares (OLS) regression models to examine the association between religious affiliation and human biological science knowledge. The regression models allowed for controlling for other sociodemographic variables that may influence science knowledge. Based on previous research on religious beliefs that influence understandings of science concepts, Evangelical/Fundamentalist Protestants serve as the comparison group for religious affiliation.

## Results

Sample descriptive statistics can be found in Table 1. The average score on the human biological knowledge index was 3.71 out of 5. A majority of respondents indicated a religious affiliation of Catholic (approximately 24%), Mainline Protestant (approximately 20%), or Evangelical/Fundamentalist Protestant (approximately 17%). Women comprised half of the sample, and the average age of the respondents was 46 years. A small proportion (under 3%) of the respondents were non-white and about 18% lived in a rural location. Regarding education, 16.5% had a high school diploma or less, 39% had attended some college or received a 2-year degree, and 45% held a bachelor's degree or higher. Income distribution among the sample indicated 30% of respondents reporting $39,999 or below, 33% in the middle income range, and approximately 37% in the highest income range.

Table 1

*Descriptive Statistics*

|  | Mean/Percent | SD | Min | Max |
|---|---|---|---|---|
| Dependent variable |  |  |  |  |
| Science knowledge index | 3.71 | 0.67 | 1 | 5 |
|  |  |  |  |  |
| Focal Independent variable |  |  |  |  |
| *Religious affiliation* |  |  |  |  |
| Evangelical/Fundamentalist Protestant | 17.41% |  |  |  |
| Mainline Protestant | 20.43% |  |  |  |
| Other Protestant | 7.73% |  |  |  |
| Non-specified Protestant | 15.02% |  |  |  |
| Catholic | 23.63% |  |  |  |
| Other/Non-Christian | 5.01% |  |  |  |
| Non-affiliated | 10.78% |  |  |  |
|  |  |  |  |  |
| Control variables |  |  |  |  |
| Women | 50.46% |  |  |  |
|  |  |  |  |  |
| Age | 46.00 | 16.91 | 19 | 100 |
|  |  |  |  |  |
| Non-white | 2.54% |  |  |  |
|  |  |  |  |  |
| Live on farm/open country | 18.29% |  |  |  |
|  |  |  |  |  |
| *Education* |  |  |  |  |
| High School or Less | 16.51% |  |  |  |
| Some College/2 Year Degree | 38.76% |  |  |  |
| 4 Year Degree+ | 44.73% |  |  |  |
|  |  |  |  |  |
| *Income* |  |  |  |  |
| $39,999 and Below | 30.03% |  |  |  |
| $40,000 to $79,999 | 33.14% |  |  |  |
| $80,000+ | 36.84% |  |  |  |

N=653

ANOVA F-tests with post hoc Bonferroni tests of differences in means were conducted to determine if differences in science knowledge across religious affiliations were statistically significant (Tables 2 and 3). There were significant bivariate associations between religious affiliation and science knowledge $F(6, 646) = 20.87$, $p < 0.001$. Evangelical/Fundamentalist Protestants had a significantly lower mean level of science knowledge (M = 3.22 SD = 0.64) compared to almost all of the other groups, except Other Protestants. In addition, the Non-affiliated had a significantly higher mean level of science knowledge (M = 4.13 SD = 0.61) compared to all other religious groups.

Table 2

*One-Way Analysis of Variance of Science Knowledge by Religious Affiliation*

| Source | df | SS | MS | F | p |
|---|---|---|---|---|---|
| Between groups | 6 | 46.90 | 7.82 | 20.87 | <0.001 |
| Within groups | 646 | 241.96 | 0.37 | | |
| Total | 652 | | | | |

Table 3

*ANOVA Comparisons of Science Knowledge by Religious Affiliation Groups*

| | | | | Bonferroni Multiple Comparisons | |
|---|---|---|---|---|---|
| Group | n | Mean | SD | Evang/Fund Protestant | Non-affiliated |
| Evang/Fund Protestant | 131 | 3.22 | 0.64 | | <0.001 |
| Mainline Protestant | 164 | 3.80 | 0.60 | <0.001 | <0.01 |
| Other Protestant | 29 | 3.56 | 0.70 | | <0.001 |
| Non-specified Protestant | 86 | 3.59 | 0.60 | <0.001 | <0.001 |
| Catholic | 160 | 3.75 | 0.57 | <0.001 | <0.001 |
| Other/Non-Christian | 23 | 3.97 | 0.71 | <0.001 | <0.001 |
| Non-affiliated | 60 | 4.13 | 0.60 | <0.001 | |

Ordinary least squares (OLS) regression models were estimated to examine the association between religious affiliation and human biological science knowledge while controlling for other demographic variables (Table 4). Model 1 predicted science knowledge by the various sociodemographic variables and Model 2 was a full model with both religious affiliation and demographic variables predicting science knowledge. In Model 1 examining sociodemographics, only education level was found to be associated with science knowledge, with both those having some college ($b = 0.20$, $p < 0.05$) and those with at least a Bachelor's degree ($b = 0.24$, $p < 0.01$) had higher science knowledge compared to those with a high school degree or less.

Model 2 explored whether these differences remain while controlling for demographic factors. Even after controlling for gender, race, education, income, rural/urban location, and age, significant differences in science knowledge remained across religious affiliations. All other religious denominations reported higher science knowledge compared to their evangelical and fundamentalist Protestant counterparts. Non-religiously affiliated respondents reported almost a point higher on the index ($b = 0.95$, $p < 0.001$) compared to Evangelical/Fundamentalist Protestants. Those who were a part of Other/Non-Christian religious affiliations were over two-thirds of a point higher ($b = 0.68$, $p < 0.001$) while Mainline Protestants ($b = 0.60$, $p < 0.001$) and Catholics ($b = 0.59$, $p < 0.001$) had similar levels of higher science knowledge compared to Evangelical/Fundamentalist Protestants. Other Protestants ($b = 0.33$, $p < 0.05$) and Non-specified Protestants ($b = 0.42$, $p < 0.001$) also reported higher science knowledge than Evangelical/Fundamentalist Protestants, controlling for demographic variables. In examining the control variables, education remained positively associated with science knowledge in this full model, as expected (Sherkat, 2011). Examining the change in $R^2$ for Model 1 and Model 2, religion increased the explained variance in science knowledge by 0.17 and this increment in $R^2$ was significant, $F(6, 638) = 19.44$, $p < 0.001$.

Table 4

*OLS Regression Models Predicting Science Knowledge by Religious Affiliation and Demographics[a]*

|  | Model 1 | | Model 2 | | |
|---|---|---|---|---|---|
|  | b | SE | b | SE | |
| Mainline Protestant |  |  | 0.60 | 0.08 | *** |
| Other Protestant |  |  | 0.33 | 0.15 | * |
| Non-specified Protestant |  |  | 0.42 | 0.10 | *** |
| Catholic |  |  | 0.59 | 0.09 | *** |
| Other/Non-Christian |  |  | 0.68 | 0.13 | *** |
| Non-affiliated |  |  | 0.95 | 0.11 | *** |
| *Controls* |  |  |  |  |  |
| Women | -0.02 | 0.06 | 0.01 | 0.06 |  |
| Age | -0.003 | 0.002 | -0.002 | 0.00 |  |
| Non-white | 0.003 | 0.13 | 0.03 | 0.09 |  |
| Live on farm/open country | -0.07 | 0.08 | 0.02 | 0.08 |  |
| Some College/2 Year Degree | 0.20 | 0.10 * | 0.17 | 0.08 | * |
| 4 Year Degree+ | 0.24 | 0.09 ** | 0.21 | 0.08 | ** |
| Income $40,000 to $79,999 | 0.02 | 0.08 | 0.02 | 0.07 |  |
| Income $80,000+ | 0.12 | 0.09 | 0.10 | 0.08 |  |
| $R^2$ | 0.04 | | 0.21 | | |
| $R^2$ change | | | 0.17 | | |
| | $F(8, 645) = 2.53, p < .01$ | | $F(14, 639) = 9.81, p < .001$ | | |

[a]Omitted reference groups are Evangelical/Fundamentalist Protestants, High School or less, and Income $39,999 or below

***$p < .001$; **$p < .01$; *$p < .05$

n=653

**Discussion**

This study explored the association between religious affiliation and adult scientific literacy of human biological concepts. Overall, I found a relationship between religious affiliation and adult scientific knowledge, even after controlling for confounding demographic variables such as education, age, and gender. Support was found for previous research indicating differences in science knowledge by religion that is not explained by demographic factors (Miller, 2010; Sherkat, 2011). Specifically, as expected, Evangelical/Fundamentalist Protestants had the lowest level of human biological science knowledge compared to their counterparts in other religious groups and the non-affiliated. No significant gender, racial, age, or rural/urban differences emerged, but higher education was associated with higher levels of science literacy.

Beliefs associated with Evangelical and Fundamentalist Protestantism may affect one's scientific knowledge or willingness to see scientific research as valid when compared to important religious beliefs. This includes beliefs in the inerrancy of the Bible, God's authority, and moral objections to scientific authority. Even when educational level is taken into account, science and science knowledge may be seen as undermining religious beliefs and authority, and therefore are seen as inaccurate by those in theologically conservative religions. Lower levels of science knowledge among Evangelical/Fundamentalist Protestants may become more influential as they have garnered more support in recent years and have seen increases in the likelihood of reporting a strong religious affiliation (Schwadel, 2013). These differences in scientific knowledge, or perhaps more accurately the belief in scientific knowledge, may lead to inequalities and differences among those with more science literacy compared to those with less.

Educators, who must disseminate scientific information to students with various types of social frames, may encounter the perception among some students that science and religion are inherently in conflict. This may be important especially when teaching science to students with conservative Protestant backgrounds or beliefs. Exposure to science facts does not undermine religious perspectives among young adults (Uecker & Longest, 2017) and, of course, would not be the goal of educators. Alternatively, educators may draw upon other perspectives and worldviews utilized by others that emphasize that religion and science are compatible (Noy & O'Brien, 2016), or at least work to de-emphasize the conflict perspective. For example, this could include discussing groups and individuals that hold both scientific and religious perspectives (including some science professors (Ecklund, 2010; Gross & Simmons, 2009)) or sharing that many individuals have a more complex understanding of science and religion that includes how both are compatible and can complement one another (Longest & Smith, 2011; Scheitle, 2011). In a study of college students, Scheitle (2011) found that a majority of students thought that science and religion could support one another or are separate aspects of reality. In addition, young adults who view religion and science as compatible are more religious than those

who do not hold this perspective (Uecker & Longest, 2017). Thus, these strategies could help increase conservative Protestant students reception of science in particular and may help decrease inequalities in science knowledge.

**Limitations and Future Research**

Limitations of the current study provide avenues for future research. First, one limitation future research could address is in constructing science knowledge indices that do not contain specific topics known to challenge some religious beliefs. Indeed, some research has found that some items (e.g., about the big bang or evolution) are more typified as measures of a religious belief dimension than they are measures of scientific knowledge (Roos, 2014). Whether disagreement with specific scientific concepts such as the big bang and evolution is still concerning or an area of potential disadvantage compared to disagreeing with other science concepts or ideas remains up to individual opinion. Some may consider a rejection of specific ideologically-conflicting concepts to be a problem of science literacy, regardless of whether the reason for rejection is religious or not. Constructing a highly reliable index without including the evolution item could not be done, so the item was left in the index for the current study's analyses. Yet additional exploratory analyses indicate that significant differences in science knowledge by religious affiliation remain even when the index was constructed without the human evolution item (results available upon request). In addition, a more nationally representative sample would allow for results to be generalized to the U.S. population as a whole. Also, a closer examination of those who selected "Neither agree nor disagree" in comparison to those who agree or disagree with the science knowledge items may be fruitful in understanding those who may be satisficing by choosing an option similar to "No opinion" or "don't know" (Krosnick, 1991).

Other future research should expand on the scope of the current study. Future research should examine scientific literacy and understanding more broadly. Human biological conceptual knowledge is one of many important types of science knowledge. Future examination should also include other aspects of religion, such as strength of affiliation or religious salience among different groups for influence upon science knowledge as well. Finally, the results are generalizable to adults living in Nebraska in 2011 and future research should expand to the national population.

**Conclusion**

The current study found that inequalities in science knowledge by religious affiliation remain, even though most Americans do not perceive incompatibility between science and religion (Baker, 2012) and some scholars reject the thesis that there is inherent conflict between the two (Barbour, 2000; Evans & Evans, 2008). Science literacy is becoming increasingly relevant as our society and world become more dependent upon technological and scientific advances and as the global economy continues to expand in these markets as well. Everyday decisions, product purchases, health choices, certain job skills, and interactions with technology will depend on a scientifically-informed public. Those at odds with science or scientific advances may influence the future of funding for scientific research as a public citizen. In addition, those with less science knowledge may become left behind, and thus disadvantaged, in our society. At all ages, being informed citizens is seen as a general public good, and inequalities in science knowledge may impact individual health behaviors and engagement with public health policy.

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