Title

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Author

Evans, John H

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Growing Social and Moral Conflict Between Conservative Protestantism and Science

Abstract:

Due to conservative Protestant elites challenging scientists in the public sphere, and prominent scientists attacking religion, scholars have claimed that there is an increasing conflict between conservative Protestants and science. However, these claims have never been empirically investigated and these general claims do not specify what conflict is actually about. In this paper I use the General Social Survey from 1984 to 2010 to examine if conservative Protestants are increasingly opposed to the social and moral influence of scientists. I find evidence for increasing opposition by Biblical literalist conservative Protestants to the involvement of scientists in social debates about moral issues.

INTRODUCTION

Sociologist Gordon Gauchat finds that ideological conservatives have decreased their trust in science between 1974 and 2010, thus validating the general perspective of Mooney who writes about a growing conservative conflict with science (Gauchat 2012; Mooney 2005). Gauchat also summarizes unreported supplementary analyses which find that those who more regularly attend religious services have experienced a decline in trust in science, and he ultimately calls for research "to identify which aspects of science pose concerns for conservatives" (2012:179, 184). However, it was beyond the purposes of his paper to separate out different religious groups or to investigate which aspects of science could lead to conflict. This paper offers specification of Gauchat's findings about religion by showing an increasing conflict with science by conservative Protestants over the advocacy of moral positions by scientists in the public sphere.

In recent years much attention in the public sphere as well as in academia has been focused on conflict between religion and science. Popular books such as the Republican War on Science (Mooney 2005) suggest that a new upswing in a long conflict has emerged where religious conservatives are increasingly opposed to scientists, and the "new atheist" scientists, like Richard Dawkins, promote the view of irreconcilable conflict (Dawkins 2006). Scientists in particular claim that opposition from religion is increasing. For example, one eminent scientist speaking at the 2006 Terry Lectures at Yale said that, "while traditionally religion has felt under threat from science, now science is more equally under threat from religion as well" (Thomson 2009:2).

In very recent years a literature on the contemporary relationship between religion and

science has emerged (Ellison and Musick 1995; Evans and Evans 2008; Ecklund, Park and Veliz 2008; Ecklund 2010; Ecklund and Park 2009; Scheitle 2011; Sherkat 2011; Evans 2012; Evans 2011; Baker 2012). However, this literature has not empirically examined whether conflict between religion and science has actually changed over time. If there has been a change over time, we can use our understanding of what has changed within both religion and science over the time period to infer the causes of conflict.

The emerging science and religion literature, including this paper, is also important for understanding broader debates. In recent years scholars have moved away from secularization theories that posit a mechanical decline of religion as people come to see the truth about the natural world through science (Smith 2003; Taylor 2007; Warner, VanAntwerpen and Calhoun 2010). If religion is not in conflict with science over truth-claims about the world, then what is the engine of secularization, and what explains the limited social conflict between religion and science that we currently observe? This paper suggests that a clash between religious and scientific truth claims is not an engine of secularization.

Conflict Between Religion and Science Over What?

Social scientists, as well as participants in the public sphere, have long assumed that religious people are opposed to science because they have a distinct way of knowing about the world compared to scientists. For example, scientists have one way of explaining human origins (neo-Darwinism), and some religious traditions have a different way of knowing (Biblical exegesis). Evans and Evans call this view the "epistemological conflict narrative" (Evans and Evans 2008), and this epistemological conflict has been assumed to lead members of certain religious groups to not pursue science and scientists to not be religious.

In a recent paper, Evans examined the epistemological conflict narrative as well as other possible sources of conflict between religion and science (Evans 2011). He finds there is no religious group in the contemporary U.S. of a size analyzable with a survey that differs from the non-religious in its propensity to pursue scientific knowledge, once demographic control variables are added. This puts the general epistemological conflict narrative into question. However, he did find that many religious groups in the U.S. have a subtly different epistemological stance where they believe religious sources over scientific sources for the very few claims where they conflict. Examples include, for conservative Protestants, the origins of humans and the age of the universe. Given how few divergent fact claims there are, and that otherwise the religious are indistinguishable from the non-religious, Evans concludes that epistemological conflict is not an important element in ordinary people's relationship with science.

However, this is not the only type of conflict that could exist. Conflict between religious persons and science may not be epistemological but rather be due to the members of some religions being opposed to the social influence of scientists. Religious opposition could be a "social conflict between institutions struggling for power" (Evans and Evans 2008:97). Summarizing case studies, Evans and Evans conclude that some religious groups do not want scientists to have influence in public debates about morality. For example, opposition to teaching Darwinism has always had a strong moral component. In debates over teaching evolution, while scientists talk about "scientific results, procedures, and verifications . . . from the fundamentalists and evangelicals have come protests about the decline of Western morality" writes historian Mark Noll (2002:274). In his analysis of the GSS, Evans finds that it is only fundamentalist and evangelical Protestants who are less likely to want scientists to have

influence over public affairs than others, and this is most likely because of concern with the morality promoted by scientists (2011). Combined with the null findings for the standard epistemological conflict narrative, this suggests that opposition to science by conservative Protestants is largely a social struggle for influence in public life, often over moral issues.

Therefore, I will look for growing opposition from conservative Protestants to scientists' influence in society concerning morality. I will proceed in four steps. First, I establish that the "confidence in scientists" survey question, that has been asked repeatedly through the history of the General Social Survey, is primarily measuring moral opposition to scientists' influence in society, not opposition to the epistemology of scientists. Second, I establish that this is not only true for the average respondent, but is particularly true for conservative Protestants. Third, I show that literalist conservative Protestants are disproportionately opposed to scientists' social/moral influence in society. Finally, I show that their opposition has increased between 1984 and 2010.

WHY WOULD THERE BE INCREASING MORAL CONFLICT BETWEEN CONSERVATIVE PROTESTANTISM AND SCIENCE?

By looking at changes in moral conflict over time, we can begin to evaluate what has led to a changing relationship between particular religious groups and science. While exact data is lacking, by looking at the social history of religion and science during the period in question, we can at least point to promising areas of inquiry for researchers using other methods.

While scientists many think of themselves as "value free," in actuality they are at least perceived by conservative Protestants as advocating a number of value positions. One group of positions is abstract, such as the claim that a materialist philosophy of science teaches an implicit

moral position. For example, conservative Protestants often argue that the neo-Darwinist synthesis advocates for an a-moral directionless universe that leads children to conclude that morality is random (Evans and Evans 2010). This conservative Protestant concern has its origins in at least the early 20th century, and it is reasonable to assume it has continued since then. Therefore the null hypothesis is that there is moral conflict between conservative Protestantism and science, but that it has been constant in recent decades.

However, another perspective would suggest that moral conflict has been on the increase in the past 26 years. In the 1950s and 60s conservative Protestants were involved with issues in the public sphere such as anti-communism (Horwitz Forthcoming). In the late 1970s they joined conservative Catholics in the religious right movement. The religious right began to take positions on issues like abortion, homosexuality and sexual ethics, later turning to euthanasia and embryonic stem cell research (Wuthnow 1988). These questions of the body, and particularly reproduction and female sexuality, have always been central to the Christian tradition (Turner 1997; Louth 1997; Giordan 2009), so there was plenty of precedent for focusing on these issues.

At the same time, a change in the public presentation of science could have made conservative Protestants more likely to see scientists as a competitor in debates over the morals of the body. From the 1950s through the 1970s public issues involving scientists concerned topics like nuclear energy, pollution, weapons and the genetic modification of micro-organisms. But by the 1970s science also came to be associated with controversies over the human body with issues like abortion, birth control, human genetic engineering, organ transplantation, the definition of death, euthanasia, mind control and, later, embryonic stem cell research and cloning (Evans 2012:Chapter 1).

These new issues could all have been seen as part of a social/moral agenda of scientists,

because it was always a scientist who would be using the cutting-edge technology, like cloning or embryonic stem cell research, and it was often scientists who advocated its use. For conservative Protestants these new scientific issues would then be seen as more "religious" than previous public scientific issues like nuclear energy, given that issues of reproduction and sexuality had a long history in the Christian tradition. On an elite level, by the mid-1970s theologians and scientists were solidly engaged in clashes over the moral interpretation of these new technologies (Evans 2012:Chapter 1), which could further this perception.

Thus a growing social/moral conflict with science could have resulted from the change in the social priorities of both conservative Protestants and scientists when both groups began to make often conflicting moral claims in the public sphere. Therefore, the alternative hypothesis is that conservative Protestants have become increasingly opposed to the moral influence of scientists since 1984.

DATA

While there were a plethora of detailed questions about science on the 2006 and to a lesser extent the 2010 GSS, there is only one question about science that has been repeatedly asked throughout the history of the GSS – whether the respondent has confidence in the people running the institution of science in the U.S. The question is worded: "I am going to name some institutions in this country. As far as the people running these institutions are concerned, would you say you have a great deal of confidence, only some confidence, or hardly any confidence at all in them?" – "scientific community." This question is not framed as asking the respondent for an evaluation of the legitimacy of the methods of science, and therefore does not measure epistemological conflict. Rather, the respondent is primed to think of scientific elites as

members of an institution with social influence. 8

This priming first occurs as the question is framed as being about “the people running these institutions,” which suggests an evaluation of their character, abilities and/or goals, not the epistemology of science. The priming also occurs as the specific question about science is preceded with questions about the respondent’s confidence in banks and financial institutions, major companies, organized religion, education, the executive branch of the federal government, organized labor, the press, medicine, TV, and the US Supreme Court. It is followed by questions about confidence in the Congress and the military. Therefore, while not specifically a question about moral influence, the question is evaluating the respondent’s view of the social influence of elite scientists.

When asked for their level of confidence in the scientific community, forty-three percent of the respondents replied “a great deal,” fifty percent replied “only some,” and seven percent “hardly any.” Since so few respondents selected “hardly any,” to avoid estimation problems I combined the “only some” and “hardly any” categories to create a dichotomous variable where “1" indicates “a great deal” of confidence and “0" less confidence. This is the dependent variable for all models in this paper.

I now turn to the independent variables in the models used to confirm the interpretation of the dependent variable. Obviously opposition to the social influence of elite scientists is multi-faceted. To demonstrate that we can interpret this question as primarily concerning the moral agenda of scientists I examine whether respondents with the greatest objections to scientists having public influence over the moral issue of embryonic stem cell research (ESCR) are those who have the least confidence in the scientists.

After explaining what ESCR is, one question asks “how much influence should each of

the following groups have in deciding about government funding for stem cell research?" – "medical researchers." This is a direct measure of not wanting scientists to be influential in the public sphere on the moral issue of ESCR. Four categories from "a great deal" to "none at all" are available to the respondent. Since only 3.5% of respondents selected "none at all," this category was collapsed into the next, resulting in a three category variable ranging from "a great deal" to "a little/none at all."

To rule out the interpretation that respondents lack confidence in scientists because they disagree with their epistemological stance, I also include variables measuring the extent to which the respondent had pursued scientific knowledge. With control variables for the ability to pursue scientific knowledge such as income, education and geographic location of residence, these variables are interpreted as indicating the respondent is not pursuing scientific knowledge due to epistemological disagreement (Evans 2011).

I use five of the variables in the 2006 GSS that Evans used to measure pursuit of scientific knowledge (2011). (I did not use Evans' "was a science major" because this question was only asked of people with undergraduate degrees, unacceptably limiting the number of available cases.) For comparability I follow Evans' coding of these variables.

The first question measures the number of scientific facts known to the respondent. Evans distinguishes between facts that are and are not contested by conservative Protestantism. If a respondent has not obtained scientific knowledge, they will know fewer scientifically derived facts <u>for which there is no religious counter claim</u>. Nine non-contested "scientific fact" questions, such as whether the inside of the earth is hot or cold, were added to form a scientific fact index. The GSS also asked questions about the scientific method, focusing on the importance of empirical observation, experimental design and odds. These were combined into

an additive scientific methods index, with higher numbers indicating more knowledge (For details, see Evans 2011: Appendices A and B).

Similarly, the survey asked how informed the respondent was about "science and technology," "global warming" and "the North and South poles." The five possible response categories in each question ranged from very informed (5) to very uninformed (1), and were added to form an index of self-reported knowledge with an alpha of .750. Higher values indicate more self-reported knowledge. A continuous variable indicates how many college-level science classes the respondent has taken. A dichotomous variable indicates that the respondent has a scientific occupation.[1]

It is also possible that respondents say that they lack confidence in scientists not for moral reasons, or because they disagree with mainstream scientific epistemology, but because they hold an alternative religious epistemology. Evans identifies a epistemic stance where conservative Protestants agree with mainstream science on how to determine most facts about the world, but dissent on the few fact-claims for which there is an explicitly different conclusion in their religious tradition (e.g. the origins of humans). Such persons can be identified by their belief in the conservative Protestant versions of these claims after controlling for their general scientific knowledge. Along with the fact questions described above, respondents were also asked if the universe began with a huge explosion and whether human beings, as we know them today, developed from earlier species of animals. Each response was coded so that the scientifically correct answer was given a 2, and the incorrect, refused and don't know responses a

1 Occupations included all engineers; statisticians; mathematicians; physicians; clinical laboratory, biology, and chemical technicians; science, math, and engineering teachers; physics, chemical, atmospheric, space, geological, physical, agricultural, biological, life, food, forestry, conservation, and medical scientists. Evans restricted his measure to full time workers, however with my modeling strategy this would remove half of the cases. Therefore, my measure is of all respondents who consider themselves to have an occupation.

1. The two questions form an index with a Chronbach alpha of .598.

I also created a number of control variables. First, it is plausible that respondents have a general propensity for confidence in the people who run any institution. Since I am interested in confidence in scientists in particular, I control for general confidence with a simple additive index of the other institutional confidence questions described above (Chronbach alpha = .770). Higher values of this index are indicative of greater confidence.

I am interested in the conflict with science derived from a respondent's religiosity, not the demographic qualities disproportionately found among conservative Protestants. Therefore I control for ideological orientation, as religious conservatives are disproportionately ideological conservatives, and ideological conservatives have been found to be less trusting of science over time (Gauchat 2012). Using the POLVIEWS variable, I create dummies for conservatives and moderates, with liberals being the reference group in the models.[2] For similar reasons I created dummies for political party identification.[3]

Demographic variables that could co-vary with religion and confidence in scientists are also included. Gender, African American race, Hispanic ethnicity, southern residence and rural residence are dummy variables. Education, age and family income are coded as continuous variables. Missing values for family income were imputed using regression equation imputation in STATA using education, gender, age, race, rural, south and hours worked. Models are

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2 For POLVIEWS, the following responses resulted in being coded as a "Liberal:" "extremely liberal;" "Liberal;" and "slightly liberal." "Moderate, middle of the road" resulted in being coded as a "Moderate." "Slightly conservative;" "Conservative;" and "Extremely Conservative" resulted in being coded as a "Conservative." Respondents who did not know or did not answer were coded as missing.

3 For PARTYID, the following responses resulted in being coded as a "Democrat:" "strong Democrat;" "Not very strong democrat;" "Independent, close to Democrat." "Independent" resulted in being coded as an "Independent." "Independent, close to Republican;" "Not very strong Republican;" and "Strong Republican" resulted in being coded as a Republican. Other party, did not know and no answer were coded as missing.

weighted with the WTSSNR variable (Smith et al. 2010:3103).

Operationalizating Religion

A critical question is compared to whom are conservative Protestants disproportionately opposed to the social/moral influence of scientists? The literature on religion-science conflict does not make claims that fundamentalists are more opposed to science than Catholics or mainline Protestants. Nor does the literature make comparisons between the devoutly religious and the very small groups of atheists and agnostics. The question is why fairly small groups of committed religious believers are not like the not very religious majority of the population (Evans 2011:711). The best comparison is then between the actively religious, as represented by religious service attendance, and the religiously non-committed who do not actively participate in a religion. Therefore, dummy variables indicating that the respondent identifies with a particular religious tradition and attends regularly were created.

Specifically, I sorted respondents who claimed to attend religious services once a month or more into dummy variables for each religious tradition using a modified version of the RELTRAD scheme (Steensland et al. 2000). RELTRAD sorts respondents into conservative Protestants, mainline Protestants, black Protestants, Catholics, Jews, "others" and the nonreligious. While Jews are over-represented among scientists (Ecklund 2010; Gross and Simmons 2009) and were disproportionately responsible for the development of modern scientific institutions (Hollinger 1996), Jews cannot be analyzed separately in these data because they represent such a small minority of a random sample of Americans. They are therefore combined into the "others" category. The reference group is people who have no religious preference or who attend religious services once a year or less.

The other religion group is so heterogeneous that it cannot be substantively interpreted,

but is important to have in the model to create the correct comparison. Similarly, respondents who attend services "several times a year" are between my "non-attending" and "high-attending" groups, and therefore also need to be represented in the model. Since neither of these variables is substantively interpretable or relevant to my argument, and are only in the model to create the proper specification, for simplicity in reporting they are combined into one "other religion/moderate attender" dummy variable.

In the broader religion and science literature, the limited epistemological divide is between conservative Protestants and the non-religious concerning the few fact claims that are contradicted by a traditionalist literal reading of the Bible, like the origins of humans. It is therefore important to account for Biblical literalism in the model. But, if a measure of Biblical literalism were included separately it would be indicating the effect of literalism in religious traditions where literalism would not lead to any opposite conclusions from science (e.g. Islam) or traditions where literalism would make you a heterodox member of the religion (e.g. Catholicism). Literalism is a divide within Protestantism, and the people who are most distinct from others regarding science are members of conservative Protestant denominations who are also Biblical literalists. I will call these respondents "fundamentalists." I therefore consider respondents who claim that the Bible "is the actual word of God and is to be taken literally, word for word," and who regularly attend a church in a conservative Protestant denomination to be fundamentalists.

Both literalist conservative Protestants (fundamentalists) and evangelical Protestants have had moral/social conflict with science. Evans found that evangelicals were disproportionately opposed to scientists' influence in public affairs (Evans 2011). Therefore, those who claim that "the Bible is the inspired word of God but not everything in it should be taken literally, word for

word," or weaker statements, but who regularly attend a church in a conservative Protestant denomination, I will label as evangelicals. By this measure 10% of the respondents are attending fundamentalists and 6% are attending evangelicals. While obviously many of the respondents I code as fundamentalists would call themselves conservative evangelicals, this scheme effectively demarcates literalist and non-literalist conservative Protestants and generally reflects the somewhat less literalist approach of self-identified evangelicals (Smith 1998:23).

Since the specific denomination of the respondent necessary to create the RELTRAD variable was not precisely measured before 1984, I limit my analysis to the 1984 through 2010 GSS. (I also did not use the 1986 GSS, which lacked the biblical literalism question.) The Bible question was often only on two of the three GSS ballots, so respondents who were not asked the Bible question (or who did not know their view) were excluded from the analysis. Since the GSS question on Papal infallibility often used to divide Catholics into traditionalists and non-traditionalists was not asked until 2004, I cannot divide Catholics more precisely. Descriptive statistics can be found in Table 1.

Due to the specific hypotheses in this paper I am using model specifications and measuring religion in an unusual manner for sociologists of religion. First, models in other papers often use separate attendance and religious affiliation variables. However, the hypotheses under examination concern the difference between those exposed to conservative Protestant discourse and non-participants in religion, so attendance must be used to determine exposure to the discourse of this particular religious group. Moreover, if non-attenders were not the reference group for conservative Protestants, the only possible reference group would be another religious group. But, as mentioned above, the theories being tested do not concern comparisons between religious groups. Finally, a separate attendance variable would not be interpretable

through any theory because it would capture not only high attending conservative Protestants, but high attenders in traditions where attendance is not thought to have any impact on how the respondent views scientists.

Analytic Strategy

Two of five regression models are logistic models with interaction effects showing group-specific changes in the dependent variable. Traditional statistical tests of the interaction term are not valid because the term mixes the size of the effect with unobserved heterogeneity (Gauchat 2012:174; Allison 1999; Long 2009). While Allison (1999) identified the problem, Long (2009) has proposed an often-used solution, which is to use the equality of predicted probabilities across groups to evaluate group differences.

I used Stata 12's Margins command which produces predicted probabilities and delta significance tests. I therefore report the ordinary logistic model in the tables and report figures from the Margins tests to confirm the validity of the key logistic regression results. Reported predicted values are the average of the probability among actual persons in the data.

RESULTS

The first step is to establish that respondents who indicate a lack confidence in the leaders of the scientific community do so because they think that scientists should not be influential on social/moral debates. I use the 2006 GSS which contains the full set of variables used in this paper. The model reported in the first column of Table 2 shows that after controlling for demographics and the epistemology variables, the variable indicating that the respondent does not want scientists to be influential in debates about ESCR is highly predictive of being less confident in the scientific community. None of the epistemology variables are statistically significant, which means that it is unlikely that epistemological conflict results in a lack of

confidence in scientists. If it were, we would expect that those who do not share the epistemology with scientists would be less confident in scientists. Given that those who are the most opposed to scientists' influence in public debates about the moral issue of ESCR are the only ones less confident in science, I interpret the confidence measure to be concerning social/moral debate. Interestingly, women have less confidence in science and unsurprisingly, respondents who are more confident in the people who run elite institutions in general are more confident in the elite scientists who run the institution of science.

Insert Table 2 Here

If the confidence question is indicative of confidence in the <u>moral</u> influence of scientists, we would then expect that respondents who are members of religious traditions that have clashed with scientists over morality would have the least confidence in scientists. To evaluate this, the model reported in Column 2 of Table 2 is like the first but also includes religious group dummies. As with the previous model, there are no epistemological determinants of confidence in scientists and women are less confident in scientists. As before, those with more confidence in the people running institutions in general are more confident in scientists. The coefficient for wanting scientists to influence debates about ESCR is unchanged from the previous model. However, fundamentalists, who have the longest history of opposing scientists over morality, have less confidence in scientists. Contrary to expectations, evangelicals are not more likely to have less confidence in scientists. With the controls in the model for exposure to the epistemology of science, this means that fundamentalists are interpreting confidence in science as a statement about morality.

To provide further support for this interpretation, Table 3 reports a model that is like the

previous but also includes interaction terms of religious group and the respondent's view of scientists' influence in debates about ESCR. Unlike the previous model, one of the six epistemology variables (knowledge of scientific facts) is significant. It is unclear why introducing interactions slightly increases the size of this coefficient. As before, those with more confidence in the people who run institutions in general are more confident in scientists. The interaction term for fundamentalists is significant, which means that fundamentalists who are less desiring of scientists' influence over debates on ESCR are even less confident in scientists than the non-religious. This suggests that fundamentalists are even more likely to interpret the confidence measure as reflecting moral conflict than are others.

Insert Table 3 Here

The evangelical interaction effect falls just short of statistical significance (p=.06), but the mainline interaction effect is statistically significant and even larger than the fundamentalist effect. This means that, given that there is no primary effect on confidence for mainline Protestants in the second column of Table 2, extreme views of scientists' influence on debates about ESCR are held by mainliners who are more like fundamentalists. This reflects the diversity that exists within the mainline that is often obscured by its general liberalism.

This interpretation can best be understood by examining Figure 1. Figure 1 shows the predicted values for confidence in scientists for the non-religious, fundamentalists and mainline Protestants for different levels of the "scientists influence in ESCR debate" variable. First, examination of the lack of overlap in the confidence intervals shows that the influence of degree of their view of scientists' influence on ESCR debate is indeed different for fundamentalists than the non-religious. Second, we can see that the magnitude of the mainline interaction effect is

partly the result of the fact that at the most supportive response to scientists' influence ("1"), mainliners are even more confident in scientists than the non-religious. By the middle response ("2"), they have less confidence, and by the least supportive response ("3") they are like fundamentalists. I interpret this to mean that there is a larger range of views in the mainline about scientists than in fundamentalism, with mainliners being generally more supportive of scientists, but containing people who are basically fundamentalist in their views of science.

Insert Figure 1 Here

The previous analyses have demonstrated that, particularly for fundamentalist Protestant respondents, the "confidence in scientists" question is primarily measuring confidence in the social/moral stance of scientists. The models in Table 2 show that the question does not indicate ignorance of science or opposition to the epistemology of science. Having established the meaning of the dependent variable, I turn to the central question of whether social/moral conflict between fundamentalists and scientists has increased with time.

Figure 2 shows the raw means for the confidence question over time for fundamentalists and the non-religious. The trend for the non-religious is essentially flat with no change over time. However, the fundamentalist trend is toward less confidence. Subsequent formal models control for other factors.

Insert Figure 2 Here

The first column in Table 4 reports a model that evaluates if high attending members of different religious groups differ from the non-religious in their confidence in the social/moral stance of scientists. This model includes almost 13,000 respondents over 26 years of the GSS, so

small differences will be statistically significant.[19] Some of the coefficients of the control variables deserve mention. Confidence in scientists is declining with year. (Year was re-coded so that 1984 is equal to 1 to make the coefficients easier to interpret.) The more educated, younger, male, higher income and non-rural are more confident in the social/moral stance of scientists. Perhaps due to the history of famous cases of scientific mistreatment of African Americans, such as the Tuskegee experiment, African Americans are less confident in scientists than are Whites, with Latinos showing about half the size of the African American effect. Consistent with Gauchat, I find that ideological moderates and conservatives, compared to liberals, are less confident in scientists. Unlike Gauchat who found only independents to be different from Democrats, I found that Republicans are also less confident in scientists (Gauchat 2012:176).

Insert Table 4 Here

The model shows that members of each religious group tend to be less confident in the social/moral stance of scientists compared to the not religiously active. However, if we look at the difference in the size of the coefficients we see that fundamentalists are the least confident, followed by black Protestants, then evangelicals and Catholics, with mainliners being the most confident. (Tests of the equality of coefficients show that each of the comparisons with fundamentalism is statistically significant at $p<.05$.) This is generally consistent with what Evans found about the level of moral conflict between religious groups and science (2011:722).

Finally, I turn to the central question of whether the level confidence for fundamentalists in the social/moral stance of scientists has changed with time. The unadjusted means reported in Figure 2 show that, without controls, fundamentalists have become less confident in the

social/moral stance of scientists since 1984 compared to the non-religious. Column 2 in Table 4 reports the relationship with controls and a formal model. The only significant interaction effect is with fundamentalism, and it is negative. This means that since 1984 fundamentalists have lost confidence in the social/moral stance of scientists, while other religious groups have remained constant in their level of confidence. To get a sense of the magnitude of the change for fundamentalists, predicted values were obtained with the Margins command and reported in Figure 3. In 1984 a fundamentalist had a probability of .364 of having confidence in scientists, but by 2010 the probability was only .265. The non-religious remained unchanged over the period.

Insert Figure 3 Here

DISCUSSION AND CONCLUSION

Fundamentalists have a history of moral conflict with scientists going back to at least the Scopes trial in the 1920s. Fundamentalists thought that Darwinism undermined morality by teaching that human beings are ultimately based upon random mutations, by implying a materialist philosophy of science, and a false notion of what it meant to be human. This struggle continues to this day with Intelligent Design advocates. A leaked strategy document says that Darwin and others "portrayed humans not as moral and spiritual beings, but as animals or machines who inhabited a universe ruled by purely impersonal forces and whose behavior and very thoughts were dictated by the unbending forces of biology, chemistry, and environment" (Discovery Institute n.d.). Against this anti-Darwinist backdrop have come subsequent debates about reproduction, such as pre-implantation genetic diagnosis, and debates about the use of embryos in medical research. We can see why fundamentalists would think of themselves in

In this paper, after showing that the confidence in scientists question primarily concerns confidence in scientists' social/moral stance, not confidence in scientists' epistemological stance, I show that fundamentalists are less likely to have confidence in scientists than are the non-religious. Not only is this group the least confident of the religious groups, but it has lost confidence in the social/moral stance of scientists since 1984.

I speculate that this change has been the result of changes in both science and fundamentalist Protestantism. Over the time period fundamentalist Protestants moved from not being publicly concerned with issues concerning the body to deep involvement with these issues. At the same time scientists started engaging in research that centrally touched on issues typically thought to be "religious" having to do with the body and reproduction. Social conflict ensued, and fundamentalist Protestants became increasingly opposed to the social role of science in public debates about moral/social issues.

While we would expect that traditionalist Catholics would also be increasingly opposed to the moral message of scientists over the time period, I lacked a way to distinguish liberal and traditionalist Catholics in the data. Morever, Evans found that evangelicals were even more opposed to the moral message of scientists than were fundamentalists in debates over global warming and Embryonic Stem Cell Research (Evans 2011:722), whereas there were no evangelical effects in this paper. This may be because evangelicals as I have coded them are not as opposed to scientific influence on moral debates <u>in general</u> (as I measured here), but to influence on particular debates. It may be fundamentalists who are the most categorical in their lack of confidence in scientists regarding morality.

<u>Limitations</u>

While I have a good measure of opposition to scientists' influence in a moral debate in the 2006 GSS, my measure for the remaining years of the GSS is less direct. A limitation of this study is that there are undoubtedly other motivations for respondents not having confidence in scientists than opposition to their social/moral influence. If I had a more precise measure for the duration of the GSS I could produce more precise results.

Another limitation is the inability to distinguish between liberal and traditionalist Catholics. Fundamentalist Protestantism has the long history of moral opposition to scientists on issues like evolution, whereas Catholics were as a group not opposed to evolution. However, from the 1970s forward traditionalist Catholics increasingly oppose scientists on issues like reproductive technology, so this group may be similar to fundamentalists and have a growing moral opposition to scientists. Unfortunately, it was only in 2004 that the GSS added a question that can be used to distinguish between liberal and traditionalist Catholics, so this analysis can not be undertaken.

Contributions

This paper contributes to a number of debates. First, a long-time premise of social science has been that religion and science are locked in permanent conflict. Recently scholars have begun to clarify these assumptions (Ecklund 2010), including showing that the only religious group that consistently has had any opposition to science is conservative Protestantism (Evans 2011). It has also been clarified that this opposition is not due to a broad-based difference in how to know facts about the world, but rather is limited to a few fact claims where science and a conservative Protestant interpretation differs. Conservative Protestants have also been shown to be opposed to scientists' involvement in moral debates (Evans 2011). This paper reinforces those findings.

Second, the finding that the level of social/moral conflict between fundamentalist Protestantism and science changed over a relatively brief period of time also reinforces the emphasis of recent social science research that conflict between religion and science is not inherent or inevitable (Ecklund 2010). Rather, it is contingent upon the specific claims being made by each of the groups at any given time. Had fundamentalism not entered the public sphere to advocate on issues of the body and reproduction in 1979, the conflict observed in this paper would presumably not have happened. Similarly, had scientific research not taken its biological turn in the 1960s, steering into a conflict with the morality promoted by fundamentalists, we would also not have seen this increased conflict. While it is now hard to imagine either group diverging from its present concerns, in 1955 it would probably have been equally hard to imagine conservative Protestants' engagement with public moral issues or scientists' increasing focus on human biology. Therefore, if the interests of either group change in the future conflict may well lessen.

Third, this paper also suggests at least a partial explanation for the findings in Gauchat's paper examining the decreasing trust in science by ideological conservatives over the past 40 years (2012). Gauchat was unable to focus upon religion in detail, but simply found that religious service attendance was associated with declining trust in science. In this paper, conceptualizing what Gauchat calls lack of "trust" as social/moral conflict, I find that it is religious service attendance in fundamentalist Protestantism that is most associated with increased conflict with science, and that the component of science being opposed is not epistemological, but moral.

Fourth, and most broadly, this paper contributes to our understanding of secularization. Old views of secularization presumed a unidirectional force of modernization reducing non-

scientific (e.g. religious) claims about the world. Science does not seem to have eliminated religion in the Western world, particularly in the U.S., which is one of the most modern and scientific countries in the world. This paper suggests one reason, which is that science and religion are not primarily in conflict about how to make claims about the natural world, but to the extent to which they are in competition, they compete over social influence and morality. Growth in scientific knowledge and growth in religious belief may be entirely compatible.

Future Directions

This paper finds that fundamentalists have less confidence in the social/moral stance of scientists over the relatively short period from 1984 to 2010. I speculate that this is the result of both scientists shifting to issues that have traditionally been "religious," such as the human body, and fundamentalists coming to think of themselves as guardians of the public sphere after the rise of the religious right in 1979. Future scholarship should focus upon what exactly it is about scientists' claims that makes fundamentalists oppose scientists' influence in public. For example, is opposition issue-specific, with fundamentalists not wanting scientific influence on issues such as embryonic stem cell research, or does opposition to embryonic stem cell research lead to not wanting scientists to have influence in a public debate on any issue?

Some survey researchers have begun to examine these questions. For example, Evans and Feng examine religious views of the certainty of scientific claims about global warming. They find no religious differences in belief about scientists' claims about global warming, but do find that fundamentalists are less likely to want scientists to contribute to public debates about what to do about global warming (Evans and Feng 2012). This suggests that due to a history of moral conflict with scientists over issues like evolution and reproductive technology, fundamentalists do not want scientists to have any input into the public sphere. While survey

research is useful for these questions, it would be very useful at this stage to have in-depth qualitative research to more deeply understand the patterns in the surveys.

REFERENCES CITED

Allison, Paul D. 1999. "Comparing Logit and Probit Coefficients Across Groups." *Sociological Methods and Research* 28(2):186-208.

Baker, Joseph O. 2012. "Public Perceptions of Incompatibility Between 'Science and Religion'." *Public Understanding of Science* 21:340-53.

Dawkins, Richard. 2006. *The God Delusion*. New York, NY: Bantam.

Discovery Institute. N.d. "The Wedge." http://www.antievolution.org/features/wedge.pdf.

Ecklund, Elaine Howard. 2010. *Science Vs. Religion: What Scientists Really Think*. New York, NY: Oxford University Press.

Ecklund, Elaine Howard and Jerry Z. Park. 2009. "Conflict Between Religion and Science Among Academic Scientists?" *Journal for the Scientific Study of Religion* 48(2):276-92.

Ecklund, Elaine Howard, Jerry Z. Park, and Phil Todd Veliz. 2008. "Secularization and Religious Change Among Elite Scientists." *Social Forces* 86(4):1805-39.

Ellison, Christopher G. and Marc A. Musick. 1995. "Conservative Protestantism and Public Opinion Toward Science." *Review of Religious Research* 36(3):245-62.

Evans, John H. 2011. "Epistemological and Moral Conflict Between Religion and Science." *Journal for the Scientific Study of Religion* 50(4):707-27.

———. 2012. *The History and Future of Bioethics: A Sociological View*. New York: NY: Oxford University Press.

Evans, John H. and Michael S. Evans. 2008. "Religion and Science: Beyond the Epistemological Conflict Narrative." *Annual Review of Sociology* 2008:87-105.

Evans, John H. and Justin Feng. 2012. "Conservative Protestantism and Skepticism of Scientists Studying Climate Change." Presented at the American Sociological Association, August, Denver, CO.

Evans, Michael S. 2012. "Supporting Science: Reasons, Restrictions and the Role of Religion." *Science Communication* 34(3):334-62.

Evans, Michael S. and John H. Evans. 2010. "Arguing Against Darwinism: Religion, Science and Public Morality." Pp. 286-308 in *The New Blackwell Companion to the Sociology of Religion*, edited by B. Turner. New York, NY: Blackwell.

Gauchat, Gordon. 2012. "Politicization of Science in the Public Sphere: A Study of Public Trust in the United States, 1974 to 2010." *American Sociological Review* 77(2):167-87.

Giordan, Giuseppe. 2009. "The Body Between Religion and Spirituality." *Social Compass* 56(2):226-36.

Gross, Neil and Solon Simmons. 2009. "The Religiosity of American College and University Professors." *Sociology of Religion* 70:101-29.

Hollinger, David A. 1996. *Science, Jews, and Secular Culture: Studies in Mid-Twentieth-Century American Intellectual History*. Science, Jews, and Secular Culture: Studies in Mid Twentieth Century American Intellectual History; 50 cites. Princeton, NJ: Princeton University Press.

Horwitz, Robert. Forthcoming. *America's Right: Anti-Establishment Conservatism from Goldwater to the Tea Party*. New York: NY: Polity Press.

Long, J. Scott. 2009. "Group Comparisons in Logit and Probit Using Predicted Probabilities," University of Indiana. http://www.indiana.edu/~jslsoc/files_research/groupdif/groupwithprobabilities/groups-

with-prob-2009-06-25.pdf. 27

Louth, Andrew. 1997. "The Body in Western Catholic Christianity." Pp. 111-30 in *Religion and the Body*, edited by S. Coakley. New York: NY: Cambridge University Press.

Mooney, Chris. 2005. *The Republican War on Science*. New York, NY: Basic Books.

Noll, Mark A. 2002. "Evangelicalism and Fundamentalism." Pp. 261-76 in *Science and Religion: A Historical Introduction*, edited by G. B. Ferngren. Baltimore, MD: The Johns Hopkins University Press.

Scheitle, Christopher P. 2011. "U.S. College Students' Perception of Religion and Science: Conflict, Collaboration, or Independence? A Research Note." *Journal for the Scientific Study of Religion* 50(1):175-86.

Sherkat, Darren E. 2011. "Religion and Scientific Literacy in the United States." *Social Science Quarterly* 92(5):1134-50.

Smith, Christian. 1998. *American Evangelicalism: Embattled and Thriving*. Chicago, IL: University of Chicago Press.

———. 2003. *The Secular Revolution*. Berkeley, CA: University of California Press.

Smith, Tom W., Peter V. Marsden, Michael Hout, and Jibum Kim. 2010. *General Social Surveys, 1972-2010. [Machine-Readable Data File]. Principal Investigator, Tom W. Smith; Co-Principal Investigators, Peter V. Marsden and Michael Hout, NORC Ed. Chicago: National Opinion Research Center, Producer, 2005; Storrs, CT: The Roper Center for Public Opinion Research, University of Connecticut, Distributor. 1 Data File (55,087 Logical Records) and 1 Codebook (3,610 Pp).*

Steensland, Brian, Jerry Z. Park, Mark D. Regnerus, Lynn D. Robinson, W. Bradford Wilcox, and Robert D. Woodberry. 2000. "The Measure of American Religion: Toward Improving

the State of the Art." *Social Forces* 79(1):291-318.

Taylor, Charles. 2007. *A Secular Age*. Cambridge, MA: Harvard University Press.

Thomson, Keith. 2009. "Introduction. The Religion and Science Debate: Why Does It Continue?" Pp. 1-14 in *The Religion and Science Debate: Why Does It Continue?* edited by H. W. Attridge. New Haven, CT: Yale University Press.

Turner, Bryan S. 1997. "The Body in Western Society: Social Theory and Its Perspectives." Pp. 15-41 in *Religion and the Body*, edited by S. Coakley. New York: NY: Cambridge University Press.

Warner, Michael, Jonathan VanAntwerpen, and Craig Calhoun. 2010. *Varieties of Secularism in a Secular Age*. Cambridge, MA: Harvard University Press.

Wuthnow, Robert. 1988. *The Restructuring of American Religion*. Princeton, NJ: Princeton University Press.

Table 1: Descriptive Statistics, General Social Survey 20

	N	Min.	Max.	Mean	SD
Confidence in Scientists	20213	0	1	.428	
Independent Variables					
Religion					
Fundamentalist Protestant Frequent Attender	25998	0	1	.103	
Evangelical Protestant Frequent Attender	25998	0	1	.058	
Catholic Frequent Attender	25998	0	1	.133	
Black Protestant Frequent Attender	25998	0	1	.056	
Mainline Protestant Frequent Attender	25998	0	1	.085	
Other Religion/Moderate Attender	25998	0	1	.156	
Demographics					
Age	37573	18	89	46.0	17.4
Education	37581	0	20	13.1	3.06
Woman	37685	0	1	.561	
African-American	37685	0	1	.131	
Hispanic	37685	0	1	.067	
Southern Residence	37685	0	1	.354	
Rural Residence	37685	0	1	.247	
Family Income in Thousands	37685	.5	160	40.5	31.3
Epistemology Variables					
Knowledge of Uncontested Scientific Facts	4056	8	16	12.9	2.06
Knowledge of Scientific Methods Index	1864	7	28	23.9	4.31
Number of College Level Science Classes	3962	0	90	2.53	6.43
Claimed Knowledge About Science	1826	3	15	9.80	2.78
Has Scientific Occupation	4510	0	1	.035	
Knowledge of Religiously-contested Scientific Facts	4310	2	4	2.77	.816
Opposition to Scientists' Moral Influence in Public Affairs					
Influence of Scientists in Decisions – Stem Cell Research	1334	1	3	1.75	.703
Other					
Confidence in All Institutions	18528	12	36	24.0	4.13
Ideological Moderate	33266	0	1	.342	
Ideological Conservative	33266	0	1	.348	
Party = Independent	37144	0	1	.160	
Party = Republican	37144	0	1	.367	

Table 2: Regression Coefficients. 2006 General Social Survey. Dependent Variable = Confidence in People Running Scientific Institutions

Independent Variables		
Education	0.019	0.021
	(0.046)	(0.045)
Age	0.004	0.005
	(0.007)	(0.007)
Woman	-0.549*	-0.460*
	(0.206)	(0.210)
Family Income	0.005	0.005
	(0.003)	(0.003)
African-American	-0.091	0.099
	(0.341)	(0.481)
Hispanic	0.143	0.005
	(0.429)	(0.453)
Rural	0.067	0.224
	(0.242)	(0.245)
South	0.211	0.365
	(0.206)	(0.212)
Confidence in All Institutions	0.212***	0.223***
	(0.027)	(0.028)
Ideological Moderate	0.009	0.046
	(0.272)	(0.276)
Ideological Conservative	-0.471	-0.317
	(0.291)	(0.304)
Party = Independent	-0.463	-0.541
	(0.302)	(0.315)
Party = Republican	0.117	0.155
	(0.259)	(0.266)
Not Want Influence of Science ECSR	-0.580***	-0.572***
	(0.143)	(0.150)
Knowledge of Scientific Facts	0.123	0.125
	(0.069)	(0.069)
Self-claimed knowledge of Science	0.0435	0.0515
	(0.043)	(0.044)
Knowledge of Scientific Methods	0.0301	0.034
	(0.035)	(0.035)
Number of College Science Classes	-0.005	-0.004
	(0.018)	(0.017)
Scientific Occupation	0.008	-0.074
	(0.496)	(0.495)
Religious version of facts	0.115	0.052
	(0.133)	(0.138)
Fundamentalist Protestant	—	-1.648***
		(0.394)
Evangelical Protestant	—	-0.451
		(0.401)
Mainline Protestant	—	-0.325
		(0.371)
Black Protestant	—	-0.607
		(0.609)
Catholic	—	-0.244

		(0.337)
Other Religion/Moderate Attendance	—	-0.108
		(0.299)
Constant	-7.62***	-7.99***
N observations	739	733
Pseudo R-squared	.164	.192

The models are logistic. Standard error in parentheses. *p<.05, **p<.01, ***p<.001 (two-tailed tests).
4Table 3: Regression Coefficients. 2006 General Social Survey. Dependent Variable = Confidence in People Running Scientific Institutions

Independent Variables		*Independent Variables Continued . . ..*	
Education	0.015		
	(0.048)		
Age	0.004		-0.109
	(0.007)	Scientific Occupation	(0.523)
Woman	-0.414		0.066
	(0.216)	Religious Version of Facts	(0.141)
Family Income	0.005		0.721
	(0.003)	Fundamentalist Protestant	(1.05)
African-American	-0.010		1.956
	(0.482)	Evangelical Protestant	(1.40)
Hispanic	-0.062		3.369**
	(0.452)	Mainline Protestant	(0.985)
Rural	0.252		-1.223
	(0.252)	Black Protestant	(1.125)
South	0.357		0.388
	(0.216)	Catholic	(0.839)
Confidence in All Institutions	0.235***		0.997
	(0.029)	Other Religion/Middle	(0.775)
Ideological Moderate	0.0244	Attendance	-1.400*
	(0.276)		(0.574)
Ideological Conservative	-0.328	Influence of Scientists*	-1.263
	(0.302)	Fundamentalist	(0.672)
Party = Independent	-0.552		-2.155***
	(0.315)	Influence of Scientists*	(0.583)
Party = Republican	0.228	Evangelical	0.512
	(0.272)		(0.608)
Not Want Influence of Scientists	-0.161	Influence of Scientists* Mainline	-0.403
ECSR	(0.230)	Prot.	(0.503)
	0.141*		-0.667
Knowledge of Scientific Facts	(0.070)	Influence of Scientists* Black	(0.428)
	0.062	Protestant	
Self-claimed Knowledge of	(0.044)		-9.23***
Science	0.034	Influence of Scientists* Catholic	
	(0.035)		733
Knowledge of Scientific Methods	-0.006	Influence of Scientists*	
	(0.018)	Other/Moderate attend	.214
Number of College Science			

	Constant	
	N observations	
	Pseudo R-squared	

Note: The models are logistic. Standard error in parentheses. *p<.05, **p<.01, ***p<.001 (two-tailed tests).

5Table 4: Regression Coefficients. General Social Survey 1984 to 2010. Dependent Variable = Confidence in People Running Scientific Institutions

Independent Variables		
Education	0.111***	0.111***
	(0.009)	(0.009)
Age	-0.003*	-0.003*
	(0.001)	(0.001)
Woman	-0.342***	-0.345***
	(0.043)	(0.043)
Family Income	0.0038***	0.004***
	(0.001)	(0.001)
African-American	-0.594***	-0.589***
	(0.086)	(0.086)
Hispanic	-0.266**	-0.261**
	(0.094)	(0.094)
Rural	-0.108*	-0.110*
	(0.050)	(0.050)
South	-0.047	-0.047
	(0.046)	(0.046)
Confidence in All Institutions	0.220***	0.220***
	(0.006)	(0.006)
Ideological Moderate	-0.310***	-0.311***
	(0.055)	(0.055)
Ideological Conservative	-0.267***	-0.265***
	(0.059)	(0.059)
Party = Independent	-0.244***	-0.246***
	(0.069)	(0.069)
Party = Republican	-0.101*	-0.096
	(0.051)	(0.051)
Fundamentalist Protestant	-0.846***	-0.522**
	(0.081)	(.157)
Evangelical Protestant	-0.313**	-0.147
	(0.092)	(.193)
Mainline Protestant	-0.199*	-0.061
	(0.078)	(0.149)
Black Protestant	-0.545***	-0.484*
	(0.131)	(0.237)
Catholic	-0.279***	-0.073
	(0.068)	(0.133)
Other/Middle Attendance	-0.199**	-0.132

	(0.061) 33	(.122)
Year	-0.006*	-0.000
	(0.003)	(0.004)
Year * Fundamentalist	—	-0.021*
		(0.010)
Year * Evangelical	—	-0.011
		(0.012)
Year * Mainline Prot	—	-0.009
		(0.009)
Year * Black Protestant	—	-0.004
		(0.014)
Year * Catholic	—	-0.013
		(0.008)
Year * Other/Mid attend	—	-0.004
		(0.008)
Constant	-6.266	-6.336
N observations	12,971	12,971
Pseudo R-squared	.151	.151

Note: Models are logistic. Standard error in parentheses. *p<.05, **p<.01, ***p<.001 (two-tailed tests).