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ABSTRACT

Deliberation Enhances the Confirmation Bias: An Examination of Politics and Religion

Existing research has documented the confirmation bias in the domain of politics, but relatively little research has examined the confirmation bias in religion. I developed a novel task in the religious domain and compare confirmation bias evidence to that observed in the political domain. Using a preregistered data collection and analysis plan, I examined data from n=402 participants prescreened by political and religious beliefs. Participants were administered the online task that examined selective information exposure and perceived strength of arguments that are incongruent to one's own beliefs regarding "gun control" and the "existence of God". Results documented a confirmation bias in both information exposure and perceived argument strength. I also examined the hypothesis that the confirmation bias is stronger in situations where more thought or deliberation is brought to bear on the task. The evidence here depends on the measure of deliberation used, but generally supports this hypothesis. For example, the data showed that individuals who have thought a lot about the topic at hand (gun control and the existence of God) displayed a stronger confirmation bias in perceived argument strength than those having thought less about the issue. This paper contributes by offering new evidence documenting the confirmation bias directly compared across domains. And, the findings regarding how deliberation may worsen the bias are in line with previous research suggesting the confirmation bias may be unlike other decision biases — this bias may thrive when the decision maker is more is more deliberative or thoughtful.

JEL Classification: D91, C9, Z1

Keywords: confirmation bias, decision bias, politics, religion, behavioral economics

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INTRODUCTION

Polarization of viewpoints is of significant interest and concern given how it tends to shut down dialogue, turn discussion into heated exchange, and possibly ruin relationships. Such polarization is predicted by the "confirmation bias", which suggests we tend to seek out arguments or information that confirm our existing ideologies. This may manifest in a couple of ways. First, the confirmation bias may result in selective information exposure as we aim to shield ourselves from viewpoints that do not align with our own. Alternatively, if and when we cannot avoid opposing arguments, a confirmation bias may lead us to view opposing arguments as particularly weak. Both forms of confirmation bias effectively help reduce the cognitive dissonance felt in the presence of opposing viewpoints. This paper is aimed at examining two of the most commonly invoked ideologies when considering complex issues where polarized viewpoints and the confirmation bias are likely to be on full display: politics and religion.

While several studies have helped document the political confirmation bias, less research on this bias is available on the domain of "religious beliefs". In this paper, I develop a novel religious-beliefs task meant to explore the confirmation bias in a way similar to what has been explored in the political domain. The task is administered online to n=402 total participants who were sampled based on self-reported political and religious beliefs ideologies. The study, including sample size, hypotheses, and analysis plans, were all pre-registered on the Open Science Framework (see osf.io/en65q for the pre-registration plan). Recruitment filters are used such that the final sample is split roughly equally across Christians and Atheists (or "non-religious") as well as political conservatives and liberals, yielding about 100 participants each for the 4 possible pairings of these two characteristics.

In addition to documenting the confirmation bias across both decision domains, I also present evidence supporting the hypothesis that this particular decision bias is likely more prevalent among those who are more reflective thinkers or who have thought more about the particular issue at stake. That is, unlike the typical decision bias that is often considered to result from too *little* deliberation, the confirmation bias may be most robust among those who are more deliberative in general or, in particular, with respect to the topic in question. Unfortunately, on issues of great importance like politics and religion, these results suggest that the trajectory remains one of increased polarization that is most strong among those who have put the most thought into the issue.

BACKGROUND

Previous research has documented a confirmation bias in how individuals examine information on complex social issues (Lord et al, 1979; see Hart et al, 2009, for a review). Taber and Lodge (2006), after describing the empirical literature on the topic as rather inconclusive, developed a task to assess both the tendency towards selective information exposure and the impact of prior attitudes on the assessment of attitude-incongruent arguments in the realm of political policies (in their study, affirmative action and gun control). Their key results showed effects in both domains that predict polarization of political attitudes: selective exposure to more attitude-congruent information, and discounting of the strength of attitude-incongruent arguments. Both behaviors are classified by some as types of information avoidance (see Golman et al, 2017 on this, as well as for a review of this literature). And, while it may seem that exposure to opposing viewpoints can be an antidote for this bias, this has been shown counterproductive in the realm of the political confirmation bias. Recent evidence showed

that political attitudes can become more polarized when one is exposed to opposing views on social media (Bail et al, 2018). To better understand this, consider that one's existing beliefs represent a "status quo" ideology, and there may already be a general bias towards preserving one's status quo (Kahneman et al, 1991). This can result from an attempt to reduce the cognitive dissonance that may result from exposure to information incongruent with one's own beliefs (Festinger, 1962; Cotton, 1985; Frey, 1986; Frimer et al 2017), which would result in selective information exposure or belief. In fact, recent research has shown that the brain's reward circuitry treats knowledge about favorable outcomes (e.g., knowledge confirming one's existing beliefs are correct) as a reward to approach (Charpentier et al, 2018) or with anticipatory utility (Kobayashi and Hsu, 2019).

While most decision biases are thought to results from less deliberative or reflective processing (Toplak et al, 2011), the confirmation bias seems to be a distinct sort of decision bias that may actually prosper with deliberation. The reason may lie in the fact that confirmation bias may result not from the experience, but rather from the *anticipation*, of cognitive dissonance (Frimer et al, 2017). Knowing that regret results from being in error, an increased status quo will result if regret is asymmetric and higher in the case of mistaken status quo rejection compared to erroneous status quo acceptance (Nicolle et al, 2011). In other words, the confirmation bias is a proactive strategy that is best executed through thoughtful or reflective processes. For example, Jones and Sugden (2001) developed a theoretical framework whereby the confirmation bias results from an internally consistent and self-reinforcing pattern of reasoned thought, and a recent paper also showed that greater cognitive reflection fosters a political confirmation bias (Knobloch-Westerwick et al, 2020). While some have showed that informational utility may be sufficient to override the confirmation bias under certain circumstances (Knobloch-Westerwick and Kleinman, 2012), the reality remains that this decision bias seems to find refuge in the shelter of reflection and thought.

While a steady stream of research has shown evidence of a confirmation bias in the domain of political issues (e.g., Bakshy et al, 2015; Allcott and Gentzkow, 2017; Bail et al, 2018; Knobloch-Westerwick et al, 2020), the evidence is more scant regarding a confirmation bias in religious beliefs. That it exists is not really questioned, but research in the confirmation bias in religious beliefs is not as robust. The evidence that exists, however, not surprisingly supports the hypothesis that information belief and exposure in the religious domain is not immune to this bias. An early study (Brock and Balloun, 2015) offered some evidence that more religiously oriented individuals were less likely to want to clearly hear a message attacking Christianity than others. McFarland and Warren Jr. (1992) found that intrinsically oriented fundamentalist Christians were more likely to read belief-supportive articles. More recently, Jang (2014) reported that more religiously oriented individuals avoided news articles that would challenge their religious beliefs. A main contribution of the present study is to fill a void in this literature with the development of a religious-domain version of a selective information exposure and argument strength task along the lines of the political domain task in Taber and Lodge (2006).

METHODOLOGY

The task was developed following the basic design of Taber and Lodge (2006). For the political domain task, the issue used was "gun control", while for the religion domain task, the issue was "the existence or non-existence of God". The key features of this task are an assessment of the individual's strength of position on each topic, a self-report on how much the individual cares about the topic, how much

thought one had put into the topic[1], as well as how certain the individual was of their position on the topic. Participants were also asked on their favorability ratings regarding several topic-relevant personalities or groups. These included favorability ratings on "Trump, Clinton, Conservatives, Liberals" in the political domain, and "Jesus, Darwin, Christians, Atheists" in the religious domain. The main task elements designed to measure the confirmation bias included an "information board" task where the participant could select the source of six arguments to be viewed on the topic. Sources were made to be obviously partisan politically or religiously (see Appendix for actual arguments). The information board task was therefore a measure of selective information exposure, and one could choose to view all 6 arguments from a single source or a balance of arguments from different sources. Immediately afterwards, the participants were forced to view a set of 6 arguments on each issue (gun control and God's existence), with 3 being supportive of each viewpoint on the issue (pro versus anti gun control, and belief or not in the existence of God). Participants were asked to rate perceived argument strength, with ratings combined to generate a singular metric that captured overall perceptions of the argument strength regarding that issue. I refer to these metrics as one's "Gun Rights position" and "God Existence position".

The study was approved by the Institutional Review Board at the investigator's institution. The confirmation bias tasks were imbedded into a survey and administered through the Prolific platform (https://www.prolific.co/), which tailors the crowdsourcing approach to researchers (Schitter and Palan, 2017). Participants were paid for participation in accordance with Prolific's fair-pay standards levels. Using the respondent filters available within Prolific (but not in Amazon's mTurk platform), four separate recruitments took place that filtered on each of the self-reported dimensions: political ideology, and religious ideology. Participants on the Prolific platform fill out a detailed profile that creates a database of characteristics on which researchers may filter or selectively sample individuals for their research study. Of course, some filters may result in a final sample size that is too small to be of practical use, but these filters were used in the present study to recruit roughly equally-sized samples of U.S. participants who were self-reported "Christian, politically Conservative (**CpC**)", "Christian, politically Liberal (**CpL**)", "Atheist, politically Conservative (**ApC**), and "Atheist, politically Liberal" (**ApL**).[2] Besides these religious and political ideology screeners, the sample was restricted to U.S. participants who had voted in a U.S.

[1] We preregistered our plan to use this measure (and two others) as a proxy for deliberation in testing whether the confirmation bias is enhanced with deliberation (see Hypothesis 3).

[2] Respondents were filtered using the "Political, Religious, and personal beliefs" custom screener option in Prolific. Those we label as "Christian" responded to the question "what is your religious affiliation?" by choosing the option "Christianity (e.g., Baptist, Church of England, Roman Catholic, Methodist, Jehovah Witness, etc)". The goal of our paper is not to enter into a discussion of whether the parenthetical note is agreed upon by all who identify as Christians, or what the "etc" is supposed to encompass. Those we label simple as "Atheist" in our paper respond to that question by selecting the option "Non-religious (Agnostic, Atheist, No Religion)". So again, I intend no disrespect to those believing there are potentially important differences between descriptors within these parenthetical notes. Rather, for the sake of brevity, I have chosen what I believe to be a reasonable term to capture the intention of the response item. The options are much less controversial with respect to the "Where would you place yourself along the political spectrum?" question on political ideology. A response of "Liberal" or "Conservative" was used to filter these participants. Participants on Prolific are not aware of the filter they passed for a particular study, but rather they are simple offered the study as an available study to complete. This means that whatever filters may have been applied by the researcher to get a specific sample, he/she passed the filter(s). As such, and because beliefs may change over time, the beginning of our survey re-elicited these same characteristics using the exact language of the Prolific custom screener question and the participant was not allowed to continue the study if there was an inconsistency.

election previously. Because there may be variation in the beliefs and ideology within the group of Liberals or Christians (for example), we also elicited self-reported strength of beliefs such that we can use a somewhat more rich ideological scale than just the dichotomous identification with one group more than the other. The use of the custom filters in this study reflected a desire to ensure sufficient variation and balance in participants across the key political and religious beliefs domains.

The preregistration plan outlined the target of a total sample of n=400 participants, split equally across samples of **CpC**, **CpL**, **ApC**, and **ApL** participant types. The key pre-registered hypotheses are listed below, and they encompass key hypotheses regarding information exposure on the information board task (Hypotheses 1a and 1b), perceived argument strength (Hypotheses 2a and 2b), a test that more deliberation or thought on the issue at hand will be found to strengthen the bias (Hypothesis 3), and a comparison of the confirmation bias across the two domains of politics and religion (Hypothesis 4).[3]

Hypothesis 1a: Individuals who are more liberal (conservative) in political ideology will select to view more liberal-leaning (conservative-leaning) information on the political issue of gun control.

Hypothesis 1b: Those who self-identify as Christian (non-religious) in their religious beliefs will choose to view more arguments on the existence of God from Christian (atheist) sources

Hypothesis 2a: When required to view arguments counter to one's political ideology, individuals will perceive those arguments as more weak

Hypothesis 2b: When required to view arguments counter to one's viewpoint on the existence or non-existence of God, individuals will perceive those arguments as more weak.

Hypothesis 3: Confirmation bias evidence will be stronger for those who have put more thought into the issue (gun control or the existence of God).

Hypothesis 4: The confirmation bias will not differ in strength in the political versus religious viewpoints domain.

In addition to these measures, we preregistered our plan to use state-level sleepiness (the 9-item Karolinska sleepiness scale: Åkerstedt and Gillberg, 1990) and outcomes on a 6-item cognitive reflection task (Primi et al, 2016) as covariates that can proxy deliberation or thought put into the task (Hypothesis 3).

[3] I reorganized the numbering of these preregistered hypotheses for ease of exposition in the paper. Previously, Hypotheses 1a and 1b were used to described the confirmation bias tests with respect to political ideology (and 2a and 2b with respect to religious ideology) in the preregistration plan. The new numbering above uses Hypotheses 1a and 1b to represent the selective information exposure hypotheses with respect to political, and then religious ideologies, respectively. Hypotheses 2a and 2b are now used to described the hypotheses with respect to biased perceptions of argument strength. I also changed the numbering of Hypotheses 3 and 4 relative to the numbering given in the preregistration document, which was reversed, but the overall set of preregistered hypotheses remains unchanged (as it must).

RESULTS

A summary of the sample characteristics across our respondent groups is shown in Table 1. It is worth noting that, while the sample sizes in each cell are roughly equal, these groups differ greatly in their rarity within the Prolific respondent pool (and, likely, in the general population). There are currently about 19,000 total respondents in the Prolific database who report having previously voted in a U.S. election. Of those, n=3649 met the criteria of Atheist, politically Liberal (**ApL**), which means that we aimed to recruit approximately 2.8% of the viable Prolific participant pool on this combination of characteristics. For the other respondent groups, the target recruitment percentages were 7.1% (**CpL**), 8.6% (**CpC**), and 52.4% (**ApC**). In other words, the Atheist, political-Conservative (**ApC**) respondent is the most rare type we sought to recruit, by a large margin.[4] Mann-Whitney tests on the age and gender balance across groups showed that Christian participants were significantly older than Atheistic participants (Mann-Whitney, z= 4.078, $p < .01$) but split statistically equally across gender (2-sample proportions test, z=1.297, $p > .10$). On the other hand, Politically liberal participants were marginally younger than conservative participants (Mann-Whitney, z=1.898, $p = .058$) and more likely to be female (2-sample proportions test, z=-4.188, $p < .01$).

Table 2 presents summary statistics on measures of how much one cares about, or has thought about, each issue, their favorability ratings on issue-relevant personalities/groups, and the overall metric that summarizes the extremity of respondent positions on "gun rights" and "God existence". The position extremity measure combined responses on one's position on each of a series of 6 position statements that include a combination of assertions both for and against guns rights and for and against the existence of God. The measure was then scored such a singular metric is created that ranges from -24 to +24 (each statement involves a -4 to +4 ratings scale of agreement). Scoring was constructed such that positive (negative) values indicated a position more extremely in agreement (disagreement) with gun rights or the existence of God. For the main task *Argument Strength* measure, a similar approach was used to combine assessments on the strength or weakness of a set of arguments both for and against one's position so that a singular metric $\in [-24 , +24]$. Looking at the Table 2 political issue measures, we see from our samples that both our liberals and conservatives samples cared equally about gun control and had thought equally about the issue (Mann-Whitney test, $p > .10$ in both instances). As expected, respondents in our liberals sample were less favorable about Trump and conservatives, more favorable about (Hilary) Clinton and liberals, and held a more anti gun-rights position than conservatives (Mann Whitney, $p < .01$ for all comparisons). Regarding the religion measures, Christian respondents reported caring more about the issues of God's existence and had thought more about the issue (Mann Whitney, $p < .01$ in both instances). Christian respondents were significantly more favorable about Jesus and Christians, less favorable about Darwin and Atheists, and held a more pro God exists position than the Atheist respondents in our sample (Mann Whitney, $p < .01$ for all comparisons).

Confirmation Bias tests: Selective Information Exposure **(Hypotheses 1a and 1b)**

[4] The exact percentages, as well as the exact number of viable Prolific participants changes daily, and so there are approximations. The viable participant based on one's custom screening criteria is presented to the researcher and is defined as the number of matching participant in the Prolific database who have been active (on Prolific) in the last 90 days.

To test our pre-registered hypotheses, we start with a test of selective information search. Hypotheses 1a and 1b test these with respect to political and religious identification, respectively. First, we conducted Mann-Whitney tests to examine differences in median number of pro-Gun-Control and pro-God-Exists information clips viewed among *Liberal* (n=202) vs. *Conservative* (n=200) and *Christian* (n=101) vs. *Atheist* (n=101) respondents. These tests indicate that the median number of pro-Gun-Control arguments was significantly lower among *Liberal* respondents ($z=5.252$, $p < .01$), and the number of pro-God-exists arguments viewed was significantly lower amount *Atheist* respondents ($z=6.469$, $p < .01$).[5] Next, I estimated regression models that used the *# Pro-Gun-Rights* arguments and # *Pro-God-Exists* arguments viewed in the information board tasks (out of 6 total arguments) as the dependent variables for the tests of Hypothesis 1a and 1b. For both tests, the key independent variable was a 5-point measure (elicited prior to the main tasks within the survey) of the strength of one liberal identification, *Liberal Scale* $\in [1 , 5]$ (1=Very Conservative, 5=Very Liberal), and the strength of one's atheism viewpoints, *Atheism Scale* $\in [1 , 5]$ (1=Strongly held Christian viewpoints, 5-Strongly held Atheist viewpoints) (see Appendix for text used to elicit each measure). Additional controls for age and gender were included in a 2nd specification of each regression model.

Results for these tests of Hypotheses 1a and 1b are shown in Table 3. As planned, we report 1-tailed test *p*-values on the coefficient estimates of the preregistered hypotheses with one-sided alternatives. In both specifications of the model estimating determinants of the number of arguments chosen from the message board (in both the politics and religion domains), there was strong support for selective information exposure consistent with the confirmation bias. Specifically, the more liberal the respondent, the *fewer* pro-Gun-Rights arguments he/she was estimated to view, and the more atheist respondent was estimated to view fewer pro-God-Exists arguments ($p < .01$ in all instances in Table 3).

Confirmation Bias tests: Biased assessment of opposing arguments **(Hypotheses 2a and 2b)**

The second dimension on which to examine the confirmation bias is through the tendency to discount arguments that run counter to one's currently held beliefs. The argument strength task elicited perceived strength or weakness of 3 arguments given on each side of the issue in both the religious and politics domain. That is, unlike the selective information exposure studied in the information board task, here the participants were required to read and comment on the strength of each argument (not whether or not the participant agrees with the argument: See the Appendix for the exact text of the argument strength tasks). The 6 argument strength assessments were combined and scored into a single metric that ranges from [-24 , +24] for both political and religious argument strengths. The scoring for the political argument strength metric was such that positive values indicate an overall

[5] The differences in selective information exposure were also significant if one examines the tests by subsample. In other words, there were significantly fewer pro-Gun-Rights arguments viewed among **CpL** compared to **CpC** samples, as well as among **ApL** compared to **ApC** samples ($p < .01$ in both instances). There were also significantly fewer pro-God-exists arguments viewed among ApC compared to **CpC**, as well as among **ApL** compared to **CpL** ($p < .01$ in both instances). Results were also similarly significant ($p < .01$ in all instances of the Mann-Whitney test) if one eliminates participants who self-rated the degree of their orientation (political or religious) as "neutral". Recall the *Liberal scale* and *Atheism* scale measures were separate elicitations compared to the dichotomous designation I used from the participant's Prolific profile for custom sample screening.

perception of stronger pro-Gun-Rights arguments, and positive values for the religious argument strength measure indicate an overall perception of stronger pro-God-Exists arguments.

Mann-Whitney tests offer support of both hypotheses 2a and 2b. Perceived argument strength of pro-Gun-Control arguments was significantly lower for Liberal compared to Conservative respondents ($z=13.685$, $p < .01$). Additionally, perceived argument strength of pro-God-exists arguments was significantly lower for Atheist compared to Christian respondents ($z=10.057$, $p < .01$). Both Hypotheses 2a and 2b were supported by similar Mann-Whitney tests on the separate subsamples that divide Table 1 by column and row (e.g., testing the political views Hypothesis 2a on the subsamples of Christian or Atheist respondents, and testing the religious views Hypothesis 2b on the subsamples of Liberal or Conservative respondents: $p < .01$ for all tests). Models similar to those in Table 3 were run on the *Argument Strength* dependent variables for the political and religious issues in Table 4. Across all models, there was strong support for the existence of a confirmation bias in perceived argument strength in the regression analysis that used the continuous control measures *Liberal Scale* and *Atheism Scale* and also included control for age and gender. In general, much more of the data variation in perceived argument strength was explained by our measures compared to the variation in the selective information exposure measure.

Confirmation Bias: Does increased thought or deliberation make it worse?

I next examine Hypothesis 3, which can be examined by altering the specifications in the Tables 3 and 4 analysis to include additional controls (and interaction terms) intended to proxy for deliberation of the participant. Hypothesis 3 is that deliberation will actually enhance the confirmation bias, and not mitigate it, as is typically assumed among decision biases. To proxy for "deliberation" I used three preregistered control variables that were each used in separate specifications contained in Table 5 and 6. The first I will refer to as the *Thought Much* variable to indicate, on a 0-100 scale how much the individuals indicates he/she has personally thought about the issue of gun control (*Thought Much Guns*) or the existence of God (*Thought Much God*). The second variable that can proxy for the availability of cognitive resources was the self-reported sleepiness of the individual, *Sleepy* (using a validated 1-9 scale common to sleep research, the Karolinska sleepiness scale of Åkerstedt and Gillberg, 1990). Lastly, one's total score (0-6) on the 6-item Cognitive Reflection Task (*CRT*, Primi et al, 201.6) can be used as a measure of how reflective (i.e.., *not* impulsive) one is in terms of thinking style. For both the politics and religion domain in Tables 5 and 6, I estimated separate models using each proxy for thinking as an added main-effect control variable, as well as the key interaction term with *Liberal Scale* or *Atheism Scale* that is used to test Hypothesis 3.

Table 5 presents estimation results for the information exposure (information board) task outcomes. This table shows replication of the earlier Table 3 results documenting a main effect of increased *Liberal Scale* (or *Atheism Scale*) reducing the number of ideologically opposing arguments one chose to view. With respect to the proxy variables for deliberation, there was only an estimated main effect of *CRT* on reducing the number of pro-God-Exists arguments viewed, holding other factors constant. The Hypothesis 3 test amounts to the test of the coefficient on the interaction terms. Here, the evidence is limited but, when significance was found, it was in the direction that suggested additional thinking somewhat *increases* the number of belief-opposing arguments viewed. This is contrary to the pre-registered hypothesis 3. It is worth noting that this finding was not robust across all models or decision

domains, but the direction of its effect suggests that additional thinking may actually make one more willing, or at least *less opposed*, to exposure to arguments incongruent with one's ideology. The only Hypothesis 3 test that showed a finding in both the politics and religion domain is with respect to CRT scores. Here, the high-CRT individuals had an estimated confirmation bias (i.e., impact of *Liberal Scale* or *Atheism Scale*) that was lower than that of low-CRT individuals. The interaction effect significance was marginal ($p < .10$) for gun control, but highly statistically significant with respect to the issue of the existence of God ($p < .01$).

The results from Table 5 estimations of information board choices may leave one feeling optimistic with respect to the likelihood that more reflection may help counteract a confirmation bias tendency. Also, note that exposure to opposing viewpoints in the information board task is voluntary and not forced as was the case in recent research suggestion exposure to opposing views increases polarization (Bail et al, 2018). However, Table 6 estimations show this optimism to be short-lived. Here, we see evidence that higher CRT scores, as well as higher levels of thought put into the issue (*Thought Much* variables) were estimated to increase the confirmation bias tendency with respect to assessing argument strength. Specifically, a more *Liberal* (or *Atheist*) respondent tended to view pro-Gun-Rights (or Pro-God-Exists) arguments as more weak, and this tendency was strongest among those who have put most thought into the issue, or who were more reflective in their thinking style, in general. With respect to the *Thought Much* terms, the estimated impact of the interaction with *Liberal/Atheism Scale* was highly statistically significant ($p < .01$) and fairly large in magnitude. To give a sense of this interaction effect, Figure 1 shows the estimated impact of one's *Liberal* and *Atheism* orientation (recall, *Liberal* or *Atheism Scale* =0 implies strong *Conservative* or *Christian* orientation, respectively). In Figures 1 and 2, forecast assessments of pro-Gun-Rights and pro-God-Exists argument are shown for individuals with *Thought Much* = 20 (low thought) versus *Thought Much* = 80 (high thought) on the respective issues.

Finally, a comparison of strength of confirmation bias across domains (Hypothesis 4) is inherently more complicated because the bias in each domain is a function of the task construction and sensitivity of ideological strength measure. Because, the sample size of each participant type within Table 1 was similar, a regression examining either confirmation bias measure (information exposure or perceived argument strength) will have roughly equal statistical power to identify a given effect size. The approach I take should be considered exploratory, as it was not outlined in the preregistration of the study. Figures 3 and 4 show the key coefficient plots on model specifications as in Tables 3 and 4, respectively, but estimated for each of the participant type subsamples. The full model estimates are in Appendix A (Tables A1 and A2), which includee the standardized beta coefficients for each regression to more clearly identify the relative contribution of each independent variable. Of course, the reduced number of observations for the subsample regressions implies reduced statistical power to identify a given effect size overall, but the comparison of estimates across the different models may be informative. It is clear from these figures that the larger confirmation bias effects estimated are in the perceived strength of incongruent arguments (i.e., significance of these effects remain in the statistically less power subsample regressions). It also appears from Figure 4 that the impact of religious ideology strength had a stronger effect on perceived strength of ideologically incongruent arguments compared to the impact of political ideology strength. That is, the most precisely estimated effects (p-values), the largest unstandardized coefficient magnitudes (effect size), and the greatest strength of effect (the standardized beta coefficients—see Table A2) of the ideology measure is found in the religious ideology models. This provides some evidence for the *rejection* of Hypothesis 4. Though more research is clearly

needed, the evidence offered from these data are more consistent with an alternative hypothesis that the confirmation bias may be stronger in the domain of religion over politics.

DISCUSSION

This paper developed and tested a novel task aimed at assessing the strength of the confirmation bias in the domain of religious ideology. Patterned after the design in Taber and Lodge (2006), which assessed confirmation bias in the political issues domain, I included both an assessment of one's voluntary exposure to ideologically opposing information and an elicitation of the perceived strength of opposing arguments that one was forced to read. A key objective of this paper was to examine the evidence on confirmation bias in multiple domains known to produce polarized viewpoints. In addition to testing key hypotheses regarding the existence of the confirmation bias, I also tested the hypothesis that the confirmation bias is *not* eliminated through reflection or thought put into the issue. This is important because it was a test of whether this particular decision bias may actually flourish under the very conditions of deliberative thought that are known to help reduce other decision biases.

I carried these tests out on a data set of over 400 individuals who self-reported their religious and political ideological positions as part of their participant-specific information on the Prolific survey platform tailored to researchers. In this way, I focused on generating data from participants who were either Christian or non-religious, and either conservative or liberal in political ideology. The results presented showed strong evidence of confirmation bias on the politically hot-topic issue of gun control, which replicates key findings from Taber and Lodge (2006), among others. I also presented clear evidence of the confirmation bias on the religious hot-top issue of the existence of God. The confirmation bias was documented through selective exposure to arguments or information friendly to one's own ideology, but was most strong in biased assessments regarding the weakness of counter-attitudinal arguments.

Regarding the impact of deliberation on the confirmation bias, the findings also supported the preregistered hypotheses in some important ways, but not across all outcome measures. Specifically, the evidence presented suggests the confirmation bias may be stronger in the domain of religion over politics, which is a rejection of Hypothesis 4. Also, though the finding was not very robust, I reported some evidence that deliberation may make one *less averse* to viewing disconfirming information or arguments in both domains (Table 5), which does not support the preregistered Hypothesis 3. However, in those instances, deliberation or thoughtfulness on the topic often also predicted a *stronger* confirmation bias with respect to assessing the strength of opposing arguments, which supports Hypothesis 3. Because the estimated confirmation bias effect is more robust across our 4 subsamples of participants with respect to assessing argument strength than selective information exposure, I conclude that deliberation most likely makes the overall effect of the confirmation bias worse. If proven to be robust, this finding would suggest a most unpleasant combination of effects, because it implies someone who is thoughtful on the issue may actual invite the opposing argument only to shoot it down more vigorously than someone who has put less thought into the issue. While this task did not place participants in the situation of *hearing* the argument from another individual in person, or from a friend or family member, it is worth considering how toxic that particular combination of effects may be for the atmosphere around the holiday meal table (e.g.).

Of course, certain limitations of this research much be acknowledged. First, individuals who opted to take this survey may be those for whom political or religious ideology is more important. Indeed, the average self-reported strength of political and religious ideology in our sample is 75.89 and 55.59, respectively, on a scale of 0-100. More research is required to understand whether these findings are robust to those who have a more weak ideology in either domain. Such individuals exist in our data, but the overall high strength of ideological in our sample leaves us with too few individuals with weak ideological strength to estimate any effects with sufficient statistical power. Another limitation of this paper is that the extent to which the confirmation bias may be limited to particularly partisan topics or issues remains unclear due to the focus solely on hot-button topics, which may also wax and wane as what one considers most controversial is not necessarily static over time.

There is currently a more extensive literature documenting the confirmation bias in the domain of political issues, but the present paper suggests that religion may be an ideologically polarizing issue that even surpasses politics in its susceptibility to the confirmation bias. And, as others have suggested in different decision domains, the evidence presented here suggests this bias is likely *not* mitigated through additional reflection or thoughtfulness on the issue at hand. This fact suggests that combating this participant decision bias presents a significant challenge indeed.

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TABLE 1: Sample Characteristics

		Political Ideology	
		Liberal	**Conservative**
Religious Ideology		**N=101**	**N=100**
	Non-Religious	Age (years) = 36.04 ± 10.8 Mean Female = 0.63 ± 0.5	Age (years) = 35.55 ± 11.4 Mean Female = 0.32 ± 0.5
	Christian	**N=101**	**N=100**
		Age (years) = 38.76 ± 13.7 Mean Female = 0.59 ± 0.5	Age (years) = 44.91 ± 14.3 Mean Female = 0.49 ± 0.5

TABLE 2: Belief/Ideology difference measures

Political Measure	**(1) Liberals** Mean (std. dev.)	**(2) Conservatives** Mean (std. dev.)	**Diff test (1)-(2)** (Mann-Whitney)
Care about gun control issue (level) → [0 , 100]	75.68 (24.21)	77.28 (21.60)	0.103 ($p > .10$)
Thought much about gun control (level) → [0 , 100]	68.34 (23.62)	69.90 (25.04)	-0.840 ($p > .10$)
Trump (favorability) → [0 , 100]	7.66 (17.99)	72.63 (26.91)	**-16.002 ($p < .01$)**
Clinton (favorability)→ [0 , 100]	48.01 (27.39)	13.74 (20.22)	**11.975 ($p < .01$)**
Conservatives (favorability)→ [0 , 100]	19.65 (20.05)	74.20 (19.54)	**-15.846 ($p < .01$)**
Liberals (favorability)→ [0 , 100]	70.86 (20.92)	22.20 (21.27)	**14.869 ($p < .01$)**
Gun Rights position measure [-24 , +24] → (pro gun-rights > 0)	-13.47 (10.22)	6.87 (12.43)	**-13.267 ($p < .01$)**
Religion Measure	**(1) Non-Religious** Mean (std. dev.)	**(2) Christian** Mean (std. dev.)	**Diff test (1)-(2)** (Mann-Whitney)
Care about issue of God's existence (level) → [0 , 100]	30.59 (30.29)	85.15 (20.49)	**-14.459 ($p < .01$)**
Thought much about God's existence (level) → [0 , 100]	59.25 (32.91)	78.35 (23.75)	**-6.181 ($p < .01$)**
Jesus (favorability) → [0 , 100]	39.39 (29.97)	89.91 (16.74)	**-14.865 ($p < .01$)**
Darwin (favorability)→ [0 , 100]	67.09 (23.48)	53.11 (28.75)	**4.838 ($p < .01$)**
Christians (favorability)→ [0 , 100]	47.11 (22.95)	77.22 (20.65)	**-11.586 ($p < .01$)**
Atheists (favorability)→ [0 , 100]	60.25 (23.72	49.29 (29.53)	**3.679 ($p < .01$)**
God Existence position measure [-24 , +24] → (pro God exists > 0)	-13.52 (7.33)	8.11 (9.97)	**-15.655 ($p < .01$)**

Notes: Results are unchanged in sign and significant if omitting the participants who rate themselves neutral on a liberal ideology scale (n=18) or neutral on a scale of religious viewpoints (n=65). Similarly, results are unaffected by excluding the 7 participants who failed the attention-check question within the survey. Position measures on guns rights and the existence or non-existence of God existence are each a composite measure across 6 items that expressed both pro- and anti-gun (or God exists and God does not exist) viewpoints (each 9-point response scale was centered at 0). See Appendix for further detail.

Table 3: Confirmation Bias Tests—Information Selection

N=402 observations	**Dep Var = # Pro-Gun-*Rights* Arguments viewed (out of 6)**		**Dep Var = # Pro-God-Exists Arguments viewed (out of 6)**	
Variable	Coefficient (std. err.)	Coefficient (std. err.)	Coefficient (std. err.)	Coefficient (std. err.)
Constant	3.670 (0.135)***	3.660 (0.222)***	3.721 (0.138)***	3.911 (0.238)***
Liberal Scale ∈ [1 , 5]	-0.216 (0.040)***	-0.212 (0.042)***	---	---
Atheism Scale ∈ [1 , 5]	---	---	-0.249 (0.041)***	-.260 (0.042)***
Age	---	0.001 0.004)	---	-0.005 (0.004)
Female (=1)	---	-0.043 (0.108)	---	0.040 0.104)
R-squared	.067	.067	.085	.088

*p < .10, ** p < .05, *** p < .01 for the 2-tailed tests (1-tailed test significance highlighted as specified in pre-registration plan of the study for *Liberal Scale* and *Atheism Scale* effects). Results are unaffected by excluding the 7 participants who failed the attention-check question within the survey.

Table 4: Confirmation Bias Tests—Perceived Argument Strength

N=402 observations	**Dep Var = perceived Argument Strength supporting gun *rights*** Scale ∈ [-24 , +24] (> 0 favors guns rights, < 0 favors gun control)		**Dep Var = perceived Argument Strength supporting existence of God** Scale ∈ [-24 , +24] (> 0 favors God exists, <0 favors God does not exist)	
Variable	Coefficient (std. err.)	Coefficient (std. err.)	Coefficient (std. err.)	Coefficient (std. err.)
Constant	13.061 (0.824)***	15.331 (1.342)***	15 .919 (0.891)***	17.426 (1.538)***
Liberal Scale ∈ [1 , 5]	-4.471 (0.245)***	-4.516 (0.254)***	---	---
Atheism Scale ∈ [1 , 5]	---	---	-6.349 (0.265)***	-6.440 (0.273)***
Age	---	-0.050 (0.025)**	---	-0.038 (0.264)
Female (=1)	---	-0.338 (0.656)	---	0.495 (0.672)
R-squared	.454	.461	.590	.593

*p < .10, ** p < .05, *** p < .01 for the 2-tailed tests (1-tailed test significance highlighted as specified in pre-registration plan of the study for *Liberal Scale* and *Atheism Scale* effects). Results are unaffected by excluding the 7 participants who failed the attention-check question within the survey.

Table 5: Tests of *Deliberation Impact* on Confirmation Bias Information Search

N=402 observations	**Dep Var = # Pro-Gun-*Rights* Arguments viewed (out of 6)**			**Dep Var = # Pro-God-Exists Arguments viewed (out of 6)**		
Variable	Coefficient (std. err.)	Coefficient (std. err.)	Coefficient (std. err.)	Coefficient (std. err.)	Coefficient (std. err.)	Coefficient (std. err.)
Constant	4.042 (0.440)***	3.275 (0.340)***	3.940 (0.282)***	4.414 (0.528)***	3.504 (0.350)***	4.521 (0.312)***
Age	0.001 (0.004)	0.002 (0.004)	0,001 (0.004)	-0.005 (0.004)	-0.004 (0.004)	-0.003 (0.004)
Female (=1)	-0.044 (0.109)	-0.049 (0.109)	-0.041 (0.109)	0.037 (0.103)	0.026 (0.105)	0.043 (0.103)
Liberal Scale ∈ [1 , 5]	-0.313 (0.125)***	-0.157 (0.085)**	-0.315 (0.076)***	---	---	---
Atheism Scale ∈ [1 , 5]	---	---	---	-0.455 (0.132)***	-0.162 (0.085)**	-0.476 (0.082)***
CRT ∈ [0 , 6]	---	---	-0.100 (0.065)	---	---	-0.208 (0.066)***
K-Sleepy ∈ [1 , 9]	---	0.111 (0.080)	---	---	0.120 (0.077)	---
Thought Much on Issue (Guns/God) ∈ [0,100]	-0.005 (0.005)	---	---	-0.007 (0.006)	---	---
CRT * Lib. Scale	---	---	0.032 (0.019)**	---	---	---
Ksleepy* Lib. Scale	---	-0.019 (0.023)	---	---	---	---
Thought Much *Guns* * Lib. Scale	0.001 (0.002)	---	---	---	---	---
CRT * Ath. Scale	---	---	---	---	---	0.065 (0.020)***
Ksleepy * Ath. Scale	---	---	---	---	-0.031* (0.023)	
Thought Much *God Ath. Scale**	---	---	---	0.003 (0.002)**	---	
R-squared	.070	.076	.074	.104	.094	.112

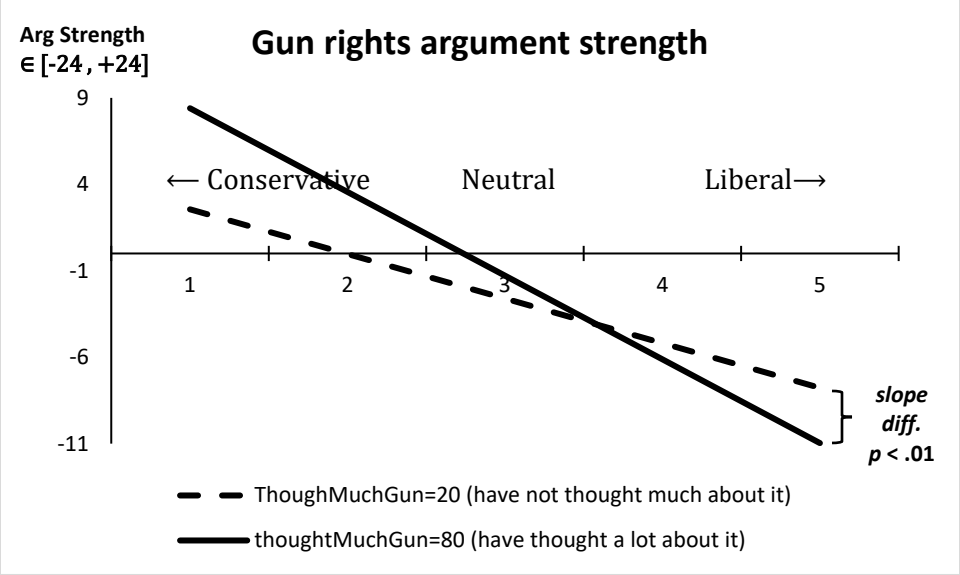
*p < .10, ** p < .05, *** p < .01 for the 2-tailed tests (1-tailed test significance highlighted as specified in pre-registration plan of the study for *Liberal Scale, Atheism Scale*, and their interaction with deliberation measures). Results are unaffected by excluding the 7 participants who failed the attention-check question within the survey.

Table 6: Tests of *Deliberation Impact* on Confirmation Bias Perceive Argument Strength.

N=402 observations	**Dep Var = perceived Argument Strength supporting gun *rights*** Scale ∈ [-24 , +24] (> 0 favors guns rights < favors gun control)			**Dep Var = perceived Argument Strength supporting existence of God** Scale ∈ [-24 , +24] (> 0 favors God exists < favors God does not exist)		
Variable	Coefficient (std. err.)	Coefficient (std. err.)	Coefficient (std. err.)	Coefficient (std. err.)	Coefficient (std. err.)	Coefficient (std. err.)
Constant	5.692 (2.611)**	16.183 (2.064)***	13.362 (1.703)***	4.366 (3.361)	17.431 (2.262)***	19.159 (1.960)***
Age	-0.059 (0.025)**	-0.045 (0.025)*	-0.055 (0.025)**	-0.050 (0.026)*	-0.043 (0.027)	-0.025 (0.027)
Female (=1)	-0.334 (0.644)	-0.484 (0.662)	-0.371 (0.657)	0.440 (0.658)	0.561 (0.676)	0.428 (0.669)
Liberal Scale ∈ [1 , 5]	-1.828 (0.740)***	-5.043 (0.513)***	-3.762 (0.457)***	---	---	---
Atheism Scale ∈ [1 , 5]	---	---	---	-2.877 (0.839)***	-6.144 (0.547)***	-6.792 (0.530)***
CRT ∈ [0 , 6]	---	---	0.685 (0.394)*	---	---	-0.813 (0.427)*
K-Sleepy ∈ [1 , 9]	---	-0.318 (0.485)	---	---	0.063 (0.498)	---
Thought Much on Issue (Guns/God) ∈ [0,100]	-0.135 (0.031)***	---	---	0.165 (0.038)***	---	---
CRT * Liberal	---	---	-0.230 (0.117)**	---	---	---
Ksleepy* Liberal	---	0.161 (0.141)	---	---	---	---
Thought Much *Guns* * Liberal	-0.038 (0.010)***	---	---	---	---	---
CRT * Atheism	---	---	---	---	---	0.143 (0.132)
Ksleepy * Atheism	---	---	---	---	-.093 (0.150)	---
Thought Much *God Atheism**	---	---	---	-0.044 (0.010)***	---	---
R-squared	.485	.464	.466	.612	.594	.600

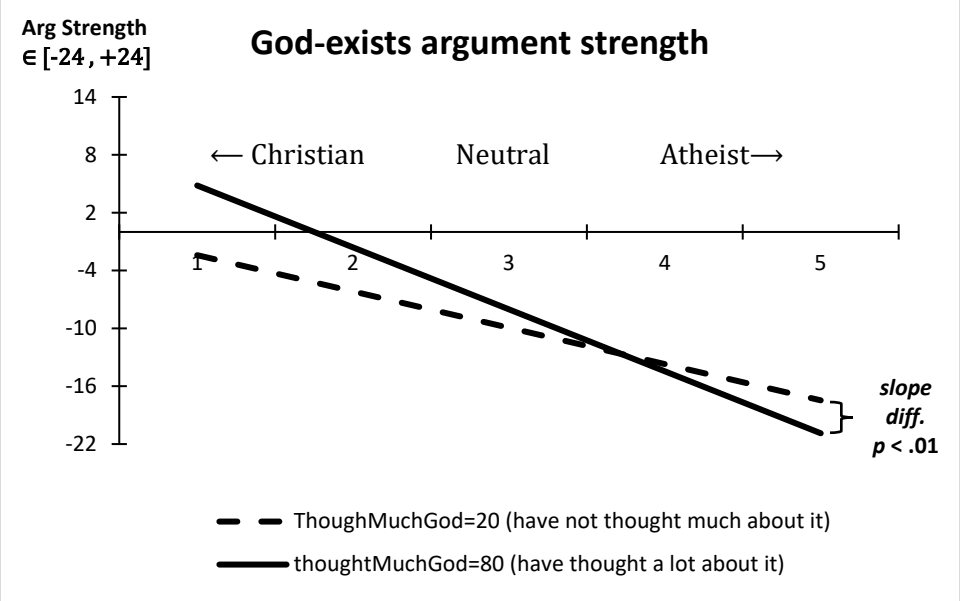
*p < .10, ** p < .05, *** p < .01 for the 2-tailed tests (1-tailed test significance highlighted as specified in pre-registration plan of the study for *Liberal Scale, Atheism Scale*, and their interaction with deliberation measures). Results are unaffected by excluding the 7 participants who failed the attention-check question within the survey.

FIGURE 1: Table 6 forecasts (deliberation impact on perceived pro-Gun-Rights argument strength)



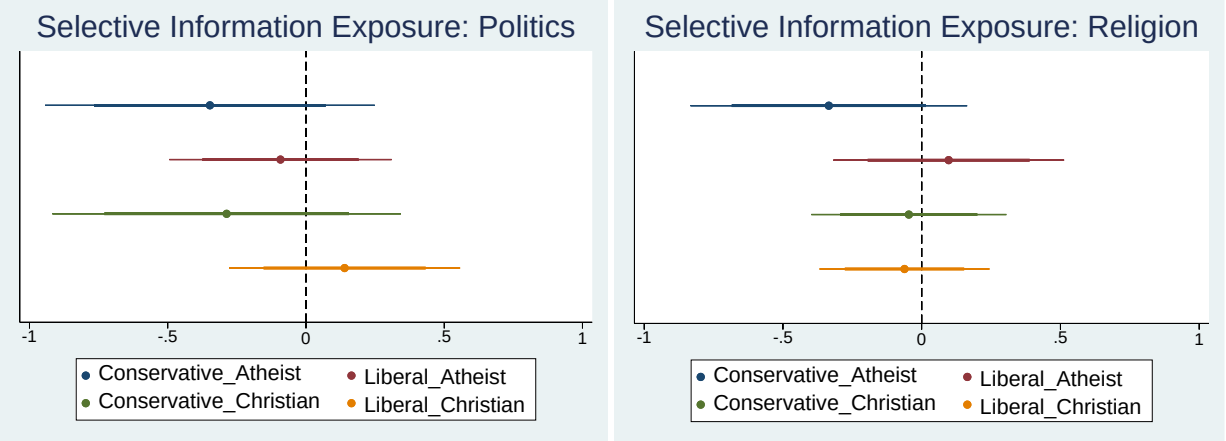
Note: Scale on *Argument Strength* axis truncated to response range observed in data

FIGURE 2: Table 6 forecasts (deliberation impact on perceived pro-God-Exists argument strength)



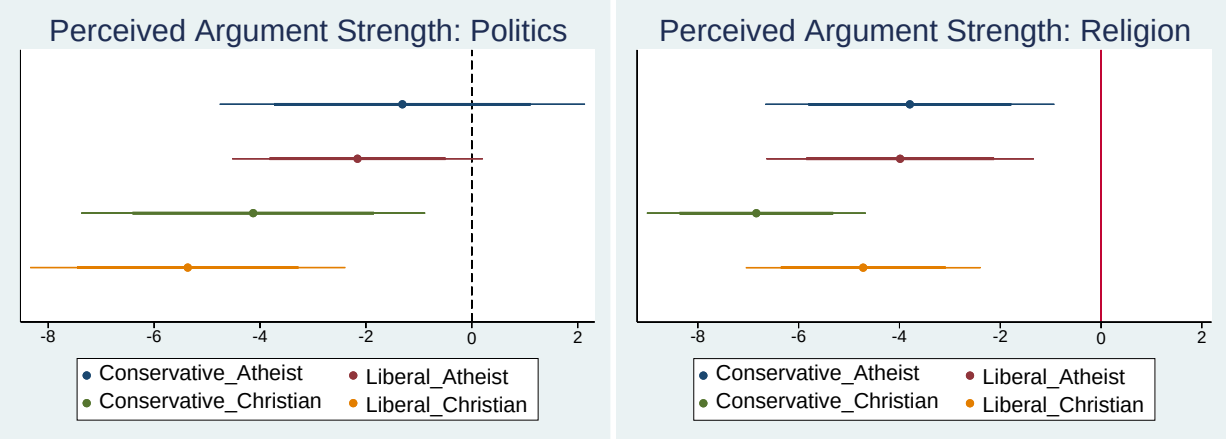
Note: Scale on *Argument Strength* axis truncated to response range observed in data

FIGURE 3: Coefficient plots for ***selective information exposure*** by subgroup (participant type) (models included controls for age and gender, whose coefficient estimate are suppressed here)



Notes: Figures show coefficient estimates for the liberal (left panel) or atheist (right panel) ideology effect on the number of incongruent arguments viewed in the information board task. Outer (inner) interval refer to the 99% (95%) confidence interval for the pre-registered 1-tail test on the ideology coefficient. See Appendix Figure A1 for full model estimates.

FIGURE 4: Coefficient plots for ***perceived argument strength*** by subgroup (participant type) (models included controls for age and gender, whose coefficient estimate are suppressed here)



Notes: Figures show coefficient estimates for the liberal (left panel) or atheist (right panel) ideology effect on the overall perceived strength of domain-specific incongruent arguments viewed in the argument strength task. Outer (inner) interval refer to the 99% (95%) confidence interval for the pre-registered 1-tail test on the ideology coefficient. See Appendix Figure A2 for full model estimates.

APPENDIX A: Additional estimation details

Table A1: Test of Confirmation Bias by Participant Type—Information Search (used in Fig. 3)

Variable	**# Pro Gun *rights* arguments viewed** (out of 6 total) Coefficients (std. err.) [standardized beta coff.]				**# Pro God exists arguments viewed** (out of 6 total) Coefficients (std. err.) [standardized beta coff.]			
	Cons & Atheist (n=100)	**Liberal & Atheist** (n=101)	**Cons & Christian** (n=100)	**Liberal & Christian** (n=101)	**Cons & Atheist** (n=100)	**Liberal & Atheist** (n=101**)**	**Cons & Christian** (n=100)	**Liberal & Christian** (n=101)
Constant	3.344 (.676)***	3.145 (.800)***	4.024 (.651)***	2.441 (.779)***	4.200 (.931)***	2.191 (.790)***	4.555 (.440)***	2.889 (.442)***
Lib Scale ∈ [1 , 5]	-.347 (.252)* [-.136]	-.092 (.170) [-.056]	-.287 (.266) [-.109]	.140 (.177) [.080]	---	---	---	---
Ath Scale ∈ [1 , 5]	---	---	---	---	-.335 (.211)* [-.159]	.097 (.176) [.056]	-.046 (.149) [-.030]	-.062 (.130) [-.048]
Age	.019 (.010)* [.182]	.001 (.008) [.012]	-.005 (.009) [-.058]	-.009 (.006) [-.152]	-.011 (.011) [-.097]	.003 (.008) [.042]	-.022 (.007)*** [-.308]	.010 (.007)* [.148]
Female (=1)	-.344 (.251) [-.136]	-.013 (.182) [-.007]	.098 (.258) [.039]	.051 (.174) [.030]	.239 (.268) [.089]	-.028 (.181) [-.016]	-.122 (.201) [-.060]	-.033 (.193) [-.018]
R^2	.076	.004	.016	.030	.044	.006	.103	.025

*p < .10, ** p < .05, *** p < .01 for the 2-tailed tests (1-tailed test significance highlighted as specified in pre-registration plan of the study for *Liberal Scale* and *Atheism Scale* effects)

Table A2: Test of Confirmation Bias by Participant Type—Perceived Argument Strength

Variable	**Perceived Strength of Pro Gun *rights* arguments** Scale ∈ [-24 , +24] (> 0 favors guns rights, < 0 favors gun control) Coefficients (std. err.) [beta coff.]				**Perceived Strength of Pro God exists arguments** Scale ∈ [-24 , +24] (> 0 favors God exists, < 0 favors God does not exist) Coefficients (std. err.) [beta coff.]			
	Cons & Atheist (n=100)	**Liberal & Atheist** (n=101)	**Cons & Christian** (n=100)	**Liberal & Christian** (n=101)	**Cons & Atheist** (n=100)	**Liberal & Atheist** (n=101)	**Cons & Christian** (n=100)	**Liberal & Christian** (n=101)
Constant	10.766 (3.908)***	7.874 (4.709)*	6.747 (3.353)**	19.568 (5.544)***	9.418 (5.356)*	7.804 (5.037)	20.607 (2.721)***	10.424 (3.362)***
Lib Scale ∈ [1 , 5]	-1.312 (1.458) [-.091]	-2.159 (1.001)** [-.209]	-4.129 (1.373)*** [-.286]	-5.364 (1.258)*** [-.386]	---	---	---	---
Ath Scale ∈ [1 , 5]	---	---	---	---	-3.794 (1.212)*** [-.302]	-3.986 (1.122)*** [-.332]	-6.839 (.918)*** [-.603]	-4.719 (.984)*** [-.440]
Age	-.034 (.060) [-.075]	-.120 (.047) [-.243]	.109 (.047)** [.225]	-.137 (.044)*** [-.283]	-.080 (.064) [-.120]	-.106 (.052)** [-.192]	-.067 (.044) [-.126]	-.017 (.053) [-.030]
Female (=1)	-1.843 (1.453) [-.128]	-1.365 (1.072) [-.124]	-.834 (1.327) [-.061]	3.201 (1.241)** [.238]	-.301 (1.541) [-.019]	.652 (1.155) [.053]	1.592 (1.243) [.105]	1.739 (1.464) [.111]
R^2	.030	.125	.137	.225	.111	.163	.382	.198

*p < .10, ** p < .05, *** p < .01 for the 2-tailed tests (1-tailed test significance highlighted as specified in pre-registration plan of the study for *Liberal Scale* and *Atheism Scale* effects)

APPENDIX B: Survey measures

Liberal Scale **measure** (continuous measure used for regression-based hypotheses tests)
Question: In terms of politics, do you consider yourself conservative, liberal, or middle-of-the-road?
(response options: 1=Very conservative, 2=Conservative, 3=Middle-of-the-road, 4=Liberal, 5=Very Liberal)

Question: How strongly to you hold to your **political** ideological positions?
(slider bar [0 , 100] scale with 0 = "**Not strongly** at all" and 100 = "**Extremely strongly"**)

Atheism Scale **measure** (continuous measure used for regression-based hypotheses tests)
Question: In terms of religious viewpoint, where do you consider yourself?
(response options: 1=Strongly held Christian viewpoints, 2=Christian viewpoints, 3=Middle-of-the-road regarding my religious viewpoints, 4=Non-religious viewpoints (includes agnostic), 5=Strongly held Atheist viewpoints)

Question: How strongly to you hold to your **religious viewpoints**?
(slider bar [0 , 100] scale with 0 = "**Not strongly** at all" and 100 = "**Extremely strongly"**)

Thermometer ratings:
Question: We'd like to get your feelings toward some of our political leaders and other people/groups who are in the news these days. I'll read the name of a person or group and I'd like you to rate that person using something we call the feeling thermometer. Ratings between 50 degrees and 100 degrees mean that you feel favorable and warm toward the person. Ratings between 0 degrees and 50 degrees mean that you don't feel favorable toward the person and that you don't care too much for that person. You would rate the person at the 50 degree mark if you don't feel particularly warm or cold toward the person.

Listing of individuals/groups: Donald Trump, Hilary Clinton, Conservatives, Liberals, Jesus Christ, Charles Darwin, Muslims, Christians, Atheists, Rich People, Middle Class People, Poor People, People on Welfare.

(slider bar [0 , 100] scale for each with 0 = "**Not favorable/cold feelings (I don't care much for this person or these people"** and 100 = **"Favorable/warm feelings towards this person or these people"**

Politics--Attitudes and Extremity of Position (measured pre- and post main tasks….pre-measures reported as baseline in Table 2 of main text).

Question: How much do you **personally care** about **the issue of gun control?**
Question: Compared to how you feel about other public issues, **how strong are your feelings regarding the issue of gun control?**
Question: Some people report that they are very certain of their feelings on the issue of gun control. Others say they are not certain at all. **How certain are you of your feelings on the issue of gun control**
Question: People have told us they have thought a lot about some issues and haven't thought at all about some other issues. How would you rate **the amount of thinking you have done about the issue of gun control**?

(for each, response is by slider bar [0 , 100] scale with 0 representing the lowest values and 100 representing the highest value on the scale for that response metric)

Politics—Extremity of Position (responses to 6 statements combined using positive and reverse scoring to create a singular metric ∈ [-24 , +24] with positive scores indicating a pro-gun-rights bias in one's position. This measure is assessed before and after main tasks, with pre-measure used as position measure in Table 2.

Statement: Curbing gun violence is very important, but limiting the right to bear arms is not really an effective way to do this.
Statement: Everyone's rights and freedoms are important, but sometimes, as with gun control, it is necessary to limit freedom for the greater public good.
Statement: Guns, like cars, should only be used by responsible citizens. Gun control laws just insure that responsible people are using guns in a responsible manner
Statement: Over the past few years our right to bear arms has been eroding. This encroachment on our rights must be stopped
Statement There should be no limits on the number of guns someone can own.
Statement: It is not the government's job to pick and choose the types of weapons it finds acceptable for citizens to own.
(for each individual item, response ∈ [-4 , +4] indicates strength of agreement or disagreement with the statement)

Religion--Attitudes and Extremity of Position (measured pre- and post main tasks….pre-measures reported as baseline in Table 2 of main text).

Question: How much do you **personaly care** about **the existence or non-existence of God?**
Question: Compared to how you feel about other public issues, **how strong are your feelings regarding the existence or non-existence of God?**
Question: Some people report that they are very certain of their feelings on the issue of the existence or non-existence of God. Others say they are not certain at all. **How certain are you of your feelings on the issue of the existence or non-existence of God?**
Question: People have told us they have thought a lot about some issues and haven't thought at all about some other issues. How would you rate **the amount of thinking you have done about the issue of the existence or non-existence of God**?
(for each, response is by slider bar [0 , 100] scale with 0 representing the lowest values and 100 representing the highest value on the scale for that response metric)

Religion—Extremity of Position (responses to 6 statements combined using positive and reverse scoring to create a singular metric ∈ [-24 , +24] with positive scores indicating a pro-gun-rights bias in one's position. This measure is assessed before and after main tasks, with pre-measure used as position measure in Table 2.

Statement: The problem of evil in the world implies a poorly designed universe and so this is not consistent with the existence of a loving creator.
Statement: Certain features of the universe are so intricate that they must be the product of an intelligent designer.

Statement: People believe in God because they want purpose in life. Belief in God simply provides an easy answer to such questions. But, that does not prove that God is real.

Statement: Because the majority of people around the world throughout recorded history believe in some form of theism, this is support for the existence of God

Statement: Most scientists argue that evolution is scientific fact supported by evidence and so it is clear that one can explain our existence without needing to believe in God.

Statement: The historical existence of Jesus, his moral character, and claimed evidence of his miraculous resurrection all support the existence of God

(for each individual item, response $\in$ [-4 , +4] indicates strength of agreement or disagreement with the statement)

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MAIN TASKS

Information Board--<u>POLITICS</u>

(respondent selects the course of each of the six arguments. Sources used for information board arguments were: Republican Party, National Rifle Association, Democratic Party, the Brady Campaign to Prevent Gun Violence)

Republican Party arguments library:

Lawful gun ownership enables Americans to exercise their God-given right of self-defense for the safety of their homes, their loved ones, and their communities.

A smaller government with less regulation is the most efficient means to run a country. The same holds true with gun rights: more interference by the government will lead to more gun deaths, not less.

Gun ownership is responsible citizenship, enabling Americans to defend their homes and communities.

Frivolous lawsuits against gun manufacturers are harmful to the safety of the American people.

It's wrong to impose federal licensing or registration of law-abiding gun owners.

Increasing access to hunting clinics and safety programs for children and adults will improve gun safety.

Democratic Party arguments library:

<u>I</u>n order to make our communities safer, we should expand and strengthen background checks and close dangerous loopholes in our current gun laws.

It is immoral and wrong to provide gun makers and sellers with legal immunity protections.

In order to make our communities safer, we should ban assault weapons and large capacity ammunition magazines. We must get these off our streets.

In order to reduce gun violence, we should focus on effective enforcement of existing laws, especially strengthening our background check system.

In order to reduce gun violence, we can work together to enact commonsense improvements--like reinstating the assault weapons ban and closing the gun show loophole--so that guns do not fall into the hands of those irresponsible, law-breaking few.

The right to own firearms is subject to reasonable regulation, but what works in Chicago may not work in Cheyenne.

National Rifle Association arguments library:

We (the NRA) oppose legislation to ban gun accessories, like bump stocks. Bills that propose doing so are intentionally violating our Constitutional right to bear arms.

Background check systems are ineffective because they don't stop criminals from getting firearms. After all, people who commit firearm crimes usually get their firearms through theft, the black market, or family members or friends

Assault weapons bans are completely ineffective. They violate our Constitutional right to defend ourselves, our families and our communities

The NRA opposes expansion of the background check system, because criminals easily get guns by other means and because expanding the background check requirement would be a step toward transforming the background check system into a national gun registry.

Self-defense is a fundamental right, and the right to use firearms for self-defense is recognized by the Constitution of the United States

The NRA does not want terrorists or dangerous people to have firearms. The NRA's only objective is to ensure that Americans who are wrongly on the terrorist watch list are afforded their constitutional right to due process.

The Brady Campaign to Prevent Gun Violence arguments library:

Many children and teens live in homes with firearms, including ones that are loaded and unlocked. This endangers the most vulnerable members of our communities.

Congress should renew the assault weapons ban. Until they do so, we are at risk for more tragic mass shootings.

The decisions by bad actors in the gun industry to engage in reckless and dangerous practices is one of the primary drivers of gun violence in America.

The evidence is clear: background checks work. They keep our communities safer and protect us from having guns fall into the hands of those who would seek to harm our children and our communities.

Experts estimate that 1 out of 5 gun sales occur in "no questions asked" transactions that often take place over the Internet or at gun shows where, in most states, background checks are not required. This dangerous loophole puts thousands and thousands of guns in the hands of dangerous people like domestic abusers, felons and the dangerously mentally ill.

Gun accessories, like bump stocks, that convert semiautomatic weapons into the functional equivalent of machine guns are dangerous and irresponsible. Congress should act to ban these devices.

Information Board—RELIGION

(respondent selects the course of each of the six arguments. Sources used for information board arguments, which included extra parenthetical information to participants for clarity were: Christian/Creation apologists (such individuals or groups) make arguments supporting God's existence), Atheist/Evolution apologists (such individuals or groups make arguments refuting God's existence), Richard Dawkins (prominent Atheist and author of "The God Delusion") or Ravi Zacharias (prominent Christian and author of "The Logic of God"). Furthermore, we provided to the respondent the following comment: "As may be obviously, the arguments in favor of God's existence will be those from Ravi Zacharias or a Christian apologist, whereas the arguments against the existence of God will be those from Richard Dawkins or an Atheist apologist."

A Christian/Creation apologist library:

DNA arranges information in a way that just cannot happen by accident, and there are no chemical or physical laws at work to dictate DNA's existence. Intelligent design of a creator is the best explanation to resolve such a basic paradox.

Without some initial cause, there can be no caused things, and no explanation for causality itself. The only rational answer is that there is at the beginning of all things something "uncaused". This argues for the existence of God.

Atheist say believing in God is like believing in Santa Claus. However, there are many examples of people who started believing in God as an adult (and no credible examples of people only starting to believe in Santa as an adult).

Evolution contradicts the 2nd law of thermodynamics, which states that disorder increases (or stays the same) over time. How then, can evolution produce more complex life forms over time?

Evolutionists cannot point to any transitional fossils in the fossil record--creature that are half reptile and half bird, for example. This discredits evolution and points to the existence of God as creator.

Evolution cannot be proven because no one has been present to observe its development from the beginning. Therefore, there is no real evidence to support it. Evolution is not science, but rather a system of beliefs used to avoid the real question of God's existence.

An Atheist/Evolution apologist library:

Why would an all-loving and all-powerful God allow evil and suffering? The most sensible explanation is that God does not exist.

If God is so loving, how can he allow anyone to go to eternal damnation and suffering. This does not make any sense, so either God is not all-loving or else he is powerless to save people and therefore not all-powerful.

The 2nd law of thermodynamics states that order should be decreasing, and some say this argues against evolution. However, the 2nd law of thermodynamics applies to a "closed" system, and so it is

completely plausible that order may increase on earth (e.g., evolution) because the "system" is not closed (i.e., the system is the entire solar system)

Hundreds of studies verify the facts of evolution, at both the microevolutionary and macroevolutionary scale--from the origin of new traits and new species to the underpinnings of the complexity in life.

While the origin of life may remain a mystery, scientists have learned about how primitive nucleic acids, amino acids and other building blocks of life could have formed and organized themselves into self-replicating and sustaining units. Thus, one does not need "God" to explain the origin of life.

Natural selection, the principal mechanism of evolution, harnesses nonrandom change by preserving “desirable” (adaptive) features and eliminating “undesirable” (nonadaptive) ones. As long as the forces of selection stay constant, natural selection can push evolution in one direction and produce sophisticated structures in surprisingly short times.

Ravi Zacharias (Christian author):

Thousands upon thousands of great thinkers throughout history have believed in the existence of God. That fact alone suggests that belief in God is hardly "irrational".

You cannot invoke any moral law without a moral lawgiver. So, if atheists wants to argue about the "problem of evil", the premise of their argument (good versus evil) is senseless unless we recognize that a moral lawgiver must exist.

If God did not exist, there would be no absolute way to know that life has meaning. We desire to know there is meaning to our lives, and this desire comes from God.

Scientific materialism leads to a belief in determinism and therefore implies we have no free will, which ironically is the criticism atheists often make of Christianity. Thus, atheist cannot make truth claims (e.g. about the non-existence of God) without violating a belief in scientific materialism.

Wherever we see intelligibility, we find intelligence behind it. God has put enough into this world to make faith in his existence a most reasonable thing.

From cosmology to history to human experience, the Christian faith (and, therefore, the existence of God) presents explanatory power in a way no other worldview does.

Richard Dawkins (Atheist author):

The appearance of design in the universe should not be confused with actual design itself. The "designer hypothesis" immediately raises the bigger problem of "who designed the designer"? (in other words, if God made everything, then who made God?)

Religious experiences should be rejected. They can be due to illusion or hallucination, which casts doubt on almost all claimed religious experiences. So, the claim of a religious experience does not prove God exists.

Santa Claus may be a valuable lesson for kids because they will learn that some things they are told are not true. This, unfortunately, does not have the desired effect always because after children learn that there is no Santa Claus, mysteriously they go on believing that there is a God.

Isn't it enough to see that a garden is beautiful without having to believe that there are fairies at the bottom of it too?

It is hard to understand a persistent false belief (i.e., the existence of God) in the face of strong contradictory evidence. As others have said, "when one person suffers from a delusion it is called insanity. When many people suffer from a delusion it is called religion."

The Virgin birth, the resurrection, the raising of Lazarus, even the Old Testament miracles, all are freely used for religious propoganda, and they are very effective with an audience of unsophisticates and children.

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Argument Strength—<u>POLITICS</u>

(for each individual item, a response ∈ [-4 , +4] indicates how "incredibly weak" (-4) to how "incredibly strong" (+4) one finds the argument. Responses on all 6 arguments are combined using positive and reverse scoring to create a singular metric ∈ [-24 , +24] with positive scores indicating pro-gun-rights arguments were found relatively more strong than pro-gun-control arguments.

BASIC INSTRUCTIONS: In this section, you are asked to read a set of arguments on gun control and **tell us how WEAK or STRONG you believe each argument is**. These arguments may be useful if you need to explain the gun control debate to someone. Please note: **We want to know how WEAK or STRONG you believe the argument is, NOT WHETHER YOU AGREE OR DISAGREE WITH THE ARGUMENT.** Please try to leave your feelings about gun control aside and indicate how strong or weak you feel the argument is. Please be as objective as possible.

REMEMBER: whether you agree or disagree with the conclusion of an argument is not the same thing as whether you think the argument is weak or strong.
The next page presents the first argument for you to rate. Please read each argument careful before giving your rating.

Argument #1: Self-defense arguments for the need of guns are silly: guns only become necessary for self-defense because there are so many guns out there. Thus, guns should be outlawed outright--then we won't need to worry about self-defense

Argument #2: The liberal media distorts gun issues: they only talk about tragedies involving guns. Yet guns were used defensively 2.5 million times last year. The real tragedy would be to outlaw guns--crime would spiral out of control.

Argument #3: Recent trials against gun manufacturers have consistently found them guilty, and have forced the gun industry to pay out huge sums of money. If the courts can find good reason to rein in the gun industry, then it is high time for Congress to follow suit.

Argument #4: Most privately-owned guns in America are owned by sportsmen and are used for completely peaceful purposes. These guns pose no risk to society, but they are unfairly targeted by gun control legislation.

Argument #5: The United States has the highest murder rate of all industrialized nations. It is also the only industrialized country that has lenient gun laws. We therefore say: bring down the number of guns, bring down the murder rate.

Argument #6: Gun control legislation can only regulate guns sold through legal outlets. But these days, many criminals buy their guns illegally. Gun control legislation therefore cannot regulate the most dangerous guns in society.

Argument Strength—<u>RELIGION</u>

(for each individual item, a response ∈ [-4 , +4] indicates how "incredibly weak" (-4) to how "incredibly strong" (+4) one finds the argument. Responses on all 6 arguments are combined using positive and reverse scoring to create a singular metric ∈ [-24 , +24] with positive scores indicating pro-God-exists arguments were found relatively more strong than arguments that God does not exist.

BASIC INSTRUCTIONS: In this section, you are asked to read a set of arguments on the existence/non-existence of god or on evolution versus creation. Please **tell us how WEAK or STRONG you believe each argument is**. These arguments may be useful if you need to explain the debate on either issue to someone.

Please note: **We want to know how WEAK or STRONG you believe the argument is, NOT WHETHER YOU AGREE OR DISAGREE WITH THE ARGUMENT.** Please try to leave your feelings about the existence or non-existence of God aside and indicate how strong or weak you feel the argument is. Please be as objective as possible.

REMEMBER: whether you agree or disagree with the conclusion of an argument is not the same thing as whether you think the argument is weak or strong.
The next page presents the first argument for you to rate. Please read each argument careful before giving your rating.

Argument #1: Belief in God does not imply superior moral behavior. There are evolutionary reasons why individuals may be altruistic or "moral" to one another, and so morality can be explained *without* the existence of God.

Argument #2: Evolutionists claim the earth must be billions of years old, but this is based on lots of assumptions. If one starts from the Bible and examines the rocks (i.e., sedimentary layers) within the framework of a global Flood (accounts of which exist in cultures across the globe), then the need for billions of years vanishes

Argument #3: The Universe does not look anything like it was created by an all-loving creator god. Did god create parasites as a punishment, or did Satan introduce them into the world? So, either god is not all-loving, or he gave Satan has creative powers not specified in the Bible, which is supposed to be without error.

Argument #4: Miraculous events have been documented with reliable testimony across many places, times, and cultures. The only adequate explanation for miracles, which must have a cause, is that God exists and is the cause of miracles.

Argument #5: Mutations drive the process of evolution without the need for any god as a creator. Given enough time, shifts in the genetic code will produce all the variety of plants and animals on earth.

Argument #6: The complexity of our DNA argues for the existence of an intelligent design (i.e., God). How did DNA, which are chemical arrangements that code in a very detailed way how each cell should act, end up in each cell? Such instructions and precise information points to a God who intentionally created such a system.

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Self Report Sleep Measures

Question: Please mark the number that best corresponds to how sleep you feel **right now**. You may mark any number, but mark only one number.
(Response options range from 1 = "Extremely alert" to 9 = "Extremely sleepy—fighting sleep". This is the Karolinska sleepiness measure: Åkerstedt and Gillberg, 1990)

Question: **Over the last 7 nights,** what is the average amount of sleep you obtained each night?
(slider bar response between 0 and 12 hrs/night, with partial hours allowed)

6-Item Cognitive Reflection Task (Primi et al, 2016)

Question: A bat and a ball cost $1.10 in total. The bat costs $1.00 more than the ball. How much does the ball cost? (please indicate your numeric answer **in cents**. For example, 30 cents would be "30", not ".30", 1 cents would be "1" and not ".01", etc)……correct = 5 cents

Question: It takes 5 minutes for 5 machines to make 5 widgets, how long would it take for 100 machines to make 100 widgets? (please indicate your numeric answer **in minutes**).....correct = 5 minutes

Question: In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover **half** the lake? (please indicate your numeric answer **in days**).....correct = 47 days

Question: If 3 elves can wrap 3 toys in 1 hour, how many elves are needed to wrap 6 toys in 2 hours? (please give your numeric answer in **# of elves**).....correct = 3 elves

Question: Jerry received both the 15th highest and the 15th lowest mark in the class. How many students are there in the class? (please give your numeric answer in **# of students**)….correct = 29 students

Question: In an athletics team, tall members are **three** times more likely to win a medal than short members. This year the team has won 60 medals so far. How many of these have been won by short athletes? (please give your numeric answer in **# of medals**)……correct = 15 medals