

<https://doi.org/10.1038/s44168-024-00109-1>

Pope Francis the Roman Catholic Church and citizen attitudes towards climate change in Latin America

Check for updates

Alejandro Ecker¹ ✉, Friederike Nüssel² & Jale Tosun³

Studies on the relationship between religious attitudes and attitudes towards climate change and other environmental issues have tended to focus on the United States. While there is good reason to expect such a relationship to exist, our understanding of it is limited first and foremost by the limited number of country-comparative studies. This study aims to reduce this gap by investigating how trust in the Church and evaluations of Pope Francis affect the views of Latin Americans on anthropogenic climate change. Our study is based on data from the 2017 Latinobarómetro with 13,472 respondents based in 18 Latin American countries. Our findings reveal that Roman Catholics are less likely to believe in manmade climate change as compared to evangelical Christians and respondents belonging to no or any other denomination. We obtain the same negative relationship between trust in the (Catholic) Church and belief in anthropogenic climate change. However, favourable assessments of Pope Francis have a positive effect, and this assessment also has a positive moderating effect on the impact of trust in the Church on the outcome variable. These findings have important implications for climate policies, as they suggest that the public demand for climate action might increase if the Roman Catholic Church in their regional dioceses, rather than mostly the Pope, were to take and communicate a more coherent, affirmative position on climate change.

Faith-based actors, such as established churches, church alliances, or “green” networks of churches like the Green Churches Network, have become increasingly engaged in high-level climate cooperation^{1,2}. In the run-up to the 2021 Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC), the leaders of the Roman Catholic Church, the Eastern Orthodox Church, and the Anglican Communion alluded to the urgency of climate change and environmental degradation, their impact on poverty, and the importance of global cooperation in *A Joint Message for the Protection of Creation*³. Although faith-based actors have long been present at the annual COPs to the UNFCCC, they have only recently started to undertake visible collective advocacy for climate action¹.

What brought about this change, or at least indicated its inception, was the publication of the encyclical devoted to global ecological change, *Laudato Si': On Care for our Common Home*, by Pope Francis⁴, which signalled the “moral gravity” of this issue⁵ and initiated a series of interventions by Pope Francis into public and elite conversations about climate change and

environmental matters⁶. These include his intervention at the European Union Youth Conference in 2022, where he addressed young people and asked them to eat less meat for the good of the environment⁷.

Several studies have sought to evaluate the impact of *Laudato Si'* on public concern and support for climate change policies, many of them with a focus on the United States⁶. For example, Myers et al. showed that Americans' and American Catholics' views on climate change changed because of the Pope's position on it⁸. Other research has shown that his intervention into public conversations seems to have further polarised the issue⁵. This study strives to offer a deeper and better understanding of how *Laudato Si'* may have affected public support for climate policies in Latin America. To this end, we differentiate between a potential “Pope Francis Effect”^{7,8}, which refers to him as a spiritual leader, and an effect of the level of trust that people have in the Roman Catholic Church, which from an interdenominational perspective, is the most precise designation of the institution that is commonly referred to as the “Catholic Church”.

¹Heidelberg Center for Ibero-American Studies, Heidelberg University, Brunnengasse 1, 69117 Heidelberg, Germany. ²Ecumenical Institute, Heidelberg University, Plankengasse 1-3, 69117 Heidelberg, Germany. ³Institute of Political Science, Heidelberg University, Bergheimer Straße 58, 69115 Heidelberg, Germany.

✉ e-mail: alejandroecker@uni-heidelberg.de

Trust is a factor which we expect to shape the influence of the Roman Catholic Church beyond the Pope, as well as to be of relevance more generally for policy decisions in the fields of climate, energy, and environmental policy (see e.g. ref. ⁹). After all, faith-based actors, such as the Roman Catholic Church, can only act as intermediaries if they are trusted¹⁰. Intermediaries are “go-between”^{11,12} who connect government actors with citizens and in this way strive to influence policy design^{2,13,14}. The intermediation of faith-based actors involves receiving and analysing (scientific) information on climate change and forming a position on it in terms of which decisions should be made or how one should behave. This position is communicated to the government and the citizenry and may be adjusted depending on the reactions the intermediary receives¹¹. Intermediaries have recently received enhanced attention in research on sustainability transitions, which includes action to reduce greenhouse gas emissions. Intermediaries who work mostly or exclusively on the issues of climate change are denoted as “climate intermediaries”^{2,13,14}.

Because of their features, intermediaries fulfil many functions in political systems: they are not only important for placing issues on the political agenda but also affect the design of the policies put forth. Furthermore, they can influence the actions and behaviours of their own congregations and members^{3,15,16}, which means that they also play an important role in policy implementation. Consequently, to improve our understanding of both climate politics and climate policy, it appears worthwhile to pay more attention to climate intermediaries.

How does the evaluation of Pope Francis affect people’s attitudes towards climate change? How does trust in the Roman Catholic Church affect attitudes towards climate change? These two research questions guide this study based on public opinion data from the 2017 Latinobarómetro survey, which covers 18 Latin American countries¹⁷. While Latin America has become religiously more plural, the Roman Catholic population remains the strong majority and in several countries, the Roman Catholic Church continues to exert noticeable influence on important social sectors and maintains a privileged relationship with governmental actors¹⁸. This empirical focus has the additional advantage of including Argentina, the home country of Pope Francis, where he is not only a spiritual but also a political figure¹⁹.

Our study builds on insights provided by empirical research on variables affecting individuals’ attitudes towards climate policy in general²⁰, and on how religion matters for attitudes towards climate change and climate action in particular^{21,22}. More precisely, it offers insights into how trust in religious institutions (most importantly, Churches) affects attitudes towards climate change²³. Perhaps the most significant insight we can offer is that in Latin America, Roman Catholics are less likely to believe in manmade climate change as compared to evangelical Christians (i.e., respondents that identify as either Evangelic without specification, Evangelic Baptist, Evangelic Methodist, Evangelic Pentecostal, Adventist, or Protestant) and respondents belonging to no or any other denomination. This finding concerning evangelical Christians stands in contrast with those reported for publics in the U.S.⁶. Furthermore, it reveals the same negative relationship between trust in the (Roman Catholic) Church and belief in anthropogenic climate change. However, favourable assessments of Pope Francis have a positive effect on this as well as a positive moderating effect on the impact of trust in the Church on the outcome variable.

The remainder of this article unfolds as follows. First, to set the stage for our analysis, we present background information on climate change as well as on the importance of the Roman Catholic Church in the 18 Latin American countries of interest. We then present our theoretical argument and formulate hypotheses. Subsequently, we turn to the description of the data and methods used for the analysis. We continue by presenting and discussing the findings of our multivariate analysis. In the final section, we offer some concluding remarks.

As varied as the Latin American region is, it comprises countries with a high vulnerability profile, which holds particularly true for the Central American countries²⁴. All countries covered in this analysis signed the Paris Agreement, which stipulates that the long-term climate goal is to keep the rise in mean global temperature to well below 2 °C above pre-industrial

levels, and preferably limit its increase to 1.5 °C²⁵. Among them, Mexico, Nicaragua, Costa Rica, Colombia, Ecuador, Peru, Chile, Argentina, and Uruguay have committed to the more ambitious objective of limiting temperature increases to 1.5 °C²⁴. It follows that all Latin American countries are affected to some extent by climate change, which suggests that their publics likewise hold certain views on the topic, including on whether climate change is manmade.

Among the faith-based intermediaries, the Roman Catholic Church stands out as the most dominant one in Latin America when looking at the region as a whole, which is why we chose to focus on it. Nonetheless, there is cross-country variation in the Roman Catholic Church’s dominance. Figure 1 shows the percentage share of Roman Catholics among the total population in the individual countries. The average share of Roman Catholics is 77% in Latin America, but the shares in Argentina, Colombia, the Dominican Republic, Honduras, Mexico, Panama, Paraguay, and Venezuela exceed this. In these countries, Catholicism is the dominant Christian denomination, and we can regard the Roman Catholic Church as a key actor in both social and political life. Guatemala, Nicaragua, El Salvador, and Brazil have relatively low shares of Roman Catholics in the population because of the rise of evangelical churches there²⁶. In these countries, and especially in Guatemala, evangelical churches can be regarded as contesting the influence and privileged position of the Roman Catholic Church.

According to the dominant view in the literature, evangelical churches and evangelical Christians tend to be sceptical concerning the existence of anthropogenic climate change²⁷, which aligns with the argument put forth by Hague and Bomberg² that faith-based intermediaries can also be organisations whose position hinders climate action. Given the rise of the spectrum and members of evangelical churches in several Latin American countries and the consensus in the pertinent literature that evangelical Christians oppose action on climate change^{27–29}, our analysis also includes a dedicated hypothesis on how Roman Catholics might compare to evangelical Christians in respect of their attitudes on manmade climate change.

The empirical basis of this study is the Latinobarómetro database. The corresponding survey included a module in 2017 with a limited number of questions on climate change. The theoretical framework that guides this study reflects the opportunities and limitations of the underlying database. This becomes apparent with the conceptualisation of the outcome variable, which captures the respondents’ answers to the question of whether human beings are the main actor responsible for climate change. This corresponds to believing that climate change is driven by anthropogenic sources of greenhouse gas emissions, such as, most importantly, carbon dioxide or methane emissions³⁰. We consider the acceptance of anthropogenic climate change as a necessary precondition for demanding more ambitious climate policies and complying with their stipulations once they are in place. Our view is corroborated by the various social movements demanding climate action, which motivate their demands by emphasising the responsibility of human beings for global warming.

Ideally, we would have used a measurement of how Latin Americans perceive of the climate action in place or what demands they would have regarding future action on climate change. But in the absence of such a policy action-oriented question, the acceptance that human activities are responsible for climate change represents an appropriate outcome variable.

A wealth of literature exists that has assessed the different types of determinants for accepting or rejecting anthropogenic climate change. This literature has identified individual-level factors, such as gender and ideology (see, e.g., ref. ³¹), as important determinants. The same is true of advocacy by climate-sceptical groups and organisations, such as the publication of books attacking climate sciences (for an overview, see, e.g., ref. ³²).

In this study, we control for established individual-level factors that could explain the respondents’ attitudes. But on a theoretical level, we wish to improve our understanding of how faith-based intermediaries can shape opinions on climate change, thereby contributing to this nascent literature examining Christian^{2,15,16,33} and other faith-based actors, such as Muslim

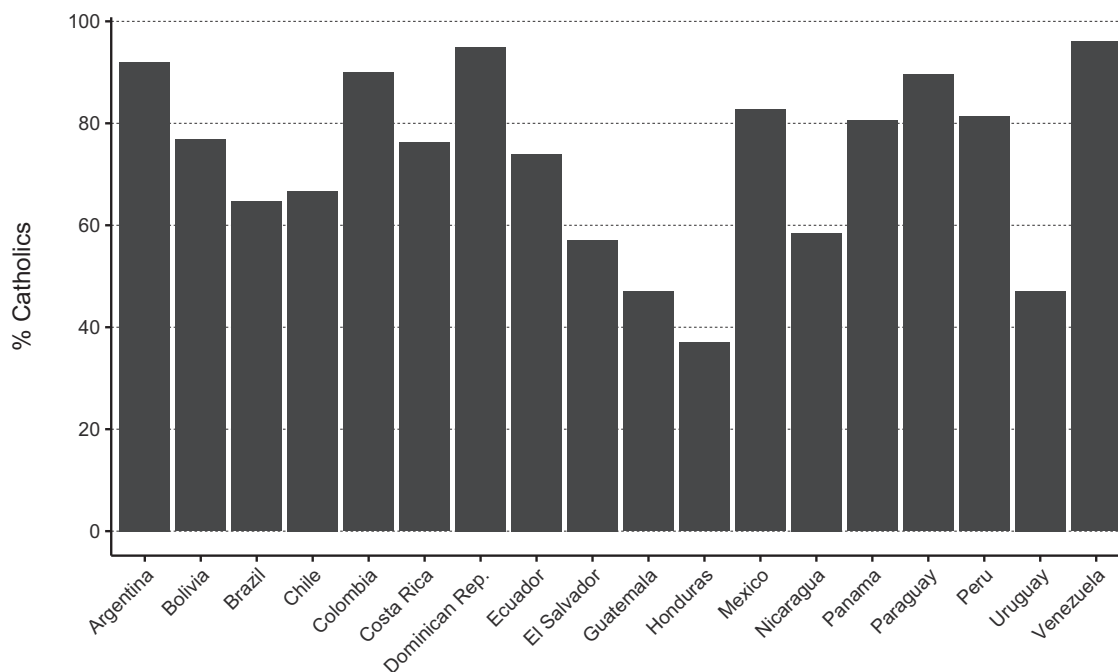


Fig. 1 | Percentage of Catholics among the total population. This figure shows the percentage of Catholics among the total population, i.e. including non-denominational citizens. Own elaboration based on data from worlddata⁴⁹.

organisations³⁴. These have the spiritual resources and ability to construct moral frameworks that can encourage human beings to protect the earth³⁵.

The reason we are interested in the Roman Catholic Church specifically is that ever since the publication of *Laudato Si'*, the mainstream section of it at the very least has made an effort to influence its members' opinions on climate change, both as an institution and through the intervention of individual clerics, mostly notably Pope Francis. In other words, we contend that there could be both an organisational and a personal intermediation effect on attitudes towards climate change. Distinguishing between these two effects appears rewarding from a theoretical perspective; above all, it would deepen our understanding of the mechanisms underlying the impacts of intermediaries, as the positions of the Roman Catholic Church and Pope Francis differ regarding their ambiguity and visibility.

Starting with the Roman Catholic Church, its position on environmental degradation and climate change, similar to that of other Christian institutions, was not explicitly and coherently represented or communicated well into the twenty-first century; in fact, it was not even coherently defined³⁵. Some scholars have argued that Christian values represent an obstacle to environment-friendly behaviour and more ambitious environmental policies³⁶, and empirical research on the American public has revealed that Catholics, Protestants, and other Christian denominations tend to show less concern about the environment^{37–39}. At the same time, other studies found there was a positive or no relationship between Christian denominations and climate and/or environmental attitudes (for an overview, see ref. ⁵).

The biblical concept of stewardship and the fact that even popes before Francis, such as John Paul II, published pastoral letters problematising how human beings use and consume natural resources and treat their environment suggest that the mainstream Roman Catholic Church has been in favour of environmental and climate action for some time (see, e.g., ref. ³⁵). This assessment is substantiated by some illustrative examples, such as the American Catholic bishops who produced a booklet on climate change and environmental justice in 2001²³. Based on this, we contend that the institutional doctrine of the mainstream Roman Catholic Church has supported climate action, and therefore we expect individuals who self-identify as Roman Catholics to be more likely to accept anthropogenic climate change.

However, as showed in the previous section, while the Roman Catholic Church was and remains the most influential Christian institution in Latin America, it now has a noteworthy competitor in the evangelical churches. This development is significant, especially since research on the United States has shown that individuals who self-identify as evangelical Christians tend to reject human-induced climate change, and that this attitude results from the information they receive from the corresponding religious authorities as well as their interpretation of this^{27,40}. Scholars have typically grounded evangelical climate denial in its scepticism towards science, which is rooted in the creation-evolution debate, as well as in evangelicalism's preference for individual over collective action²⁸. Thus, there exists a theoretical rationale as to why evangelical Christians may be unlikely to accept anthropogenic climate change. Empirically, however, the small but growing body of literature on this postulated relationship calls for caution and suggests that this relationship may only or at least mostly hold for evangelical Christians in the United States (see, e.g., ref. ²⁹).

While we are aware of these studies, we follow the mainstream literature and postulate that compared to evangelical Christians, Roman Catholics are more likely to believe in anthropogenic climate change.

H1: Compared to individuals who self-identify as evangelical Christians, those who self-identify as Roman Catholics are more likely to believe in human-induced climate change.

The assumption underlying the first hypothesis is that the institutional doctrine of each Christian denomination has an impact on its members' attitudes, which is in line with the pertinent literature^{8,29,38–41}. To have such an impact, the denomination must both have an institutional doctrine and communicate it verbally and in writing—both conditions are met for the present case^{5,23,35}. However, for communication to effect a change in attitudes and behaviour, it is important that the source of the information communicated is considered trustworthy⁴². The second hypothesis captures this reasoning and postulates that individuals who trust the Church are also more likely to believe in anthropogenic climate change. The hypothesis refers to “the Church” in a generic way, but given our distribution of religious groups in Latin America, it effectively refers to the Roman Catholic Church.

H2: Individuals who trust the (Roman Catholic) Church are more likely to believe in human-induced climate change.

The impact of the Roman Catholic Church on people’s attitudes is one thing, but the figure of Pope Francis is another. Pope Francis is popular among citizens and elites in Latin America¹⁸, but he is also contested, especially for his repeated interventions regarding climate action and related matters⁵. The review by Landrum and Vasquez⁶ of the pertinent research on U.S. publics reveals that they responded differently to the Pope’s messaging. The publics’ reactions depended on their respective view of Pope Francis as being either more or less credible. Along those lines, and informed by the literature that intermediaries can only perform their role if they are trusted by all parties to act as “go-betweens”^{2,10,13,14}, we contend that the evaluation of Pope Francis has an impact on how individuals position themselves on climate change. Those who support him are more likely to believe in anthropogenic climate change, and vice versa.

H3: Individuals who evaluate Pope Francis positively are more likely to believe in human-induced climate change.

Finally, since we believe both the Roman Catholic Church and the Pope can act as intermediaries and that the positive position of the Pope on climate change is more directly observable than the position of the Roman Catholic Church, we also postulate, in line with the pertinent research (e.g. ref. ⁴³), the existence of a moderating effect. That is, these two variables could affect the direction and/or strength of the relationship that the outcome variable has with other explanatory variables.

H4: The evaluation of Pope Francis has a moderating effect on the likelihood that individuals who trust the Roman Catholic Church also believe in human-induced climate change.

To summarise, the four hypotheses derived from the literature comprise three which postulate an unconditional effect of the Christian denomination and trust in the Roman Catholic Church and the Pope, while the fourth predicts a conditional effect.

Results

Trust in the Church and evaluations of Pope Francis

The results of a series of mixed-effect, multilevel ordered logistic regression models of belief in anthropogenic climate change are shown in Supplementary Table 2. Model 1 estimates the multivariate relationship between religious denomination, trust in the Church, assessment of Pope Francis, and belief in climate change. Model 2 includes only the control variables and potential confounders. The full model 3 then combines all explanatory variables with all control variables. Since the main findings are consistent across model specifications, the subsequent discussion of the empirical results is based on the fully specified model 3.

Figure 2 depicts the corresponding coefficient estimates, where positive values indicate a higher belief in anthropogenic climate change and vice versa. Concerning the alleged negative relationship between evangelical Christians and belief in climate change, the results of the empirical analysis refute Hypothesis 1. In fact, contrary to our theoretical expectations, and to our surprise, it seems individuals who self-identify as evangelical Christians are *significantly more likely* to accept the notion of human-induced climate change compared to Roman Catholics (reference category) at the 95% confidence level. Similarly, the empirical analysis likewise refutes the alleged positive relationship between trust in the Church and belief in climate change as postulated by Hypothesis 2. In fact, the respective model coefficients in Fig. 2 indicate that respondents who have higher levels of trust in the Church are less inclined to believe in anthropogenic climate change. Specifically, compared to respondents who have no trust at all in the Church, respondents who have a lot of trust are significantly less likely—again at the 95% confidence level—to accept the idea that human beings are the main actor responsible for climate change.

At the same time, an *F*-test of joint significance indicates that we can safely reject the null-hypothesis that trust in the Church has no effect on

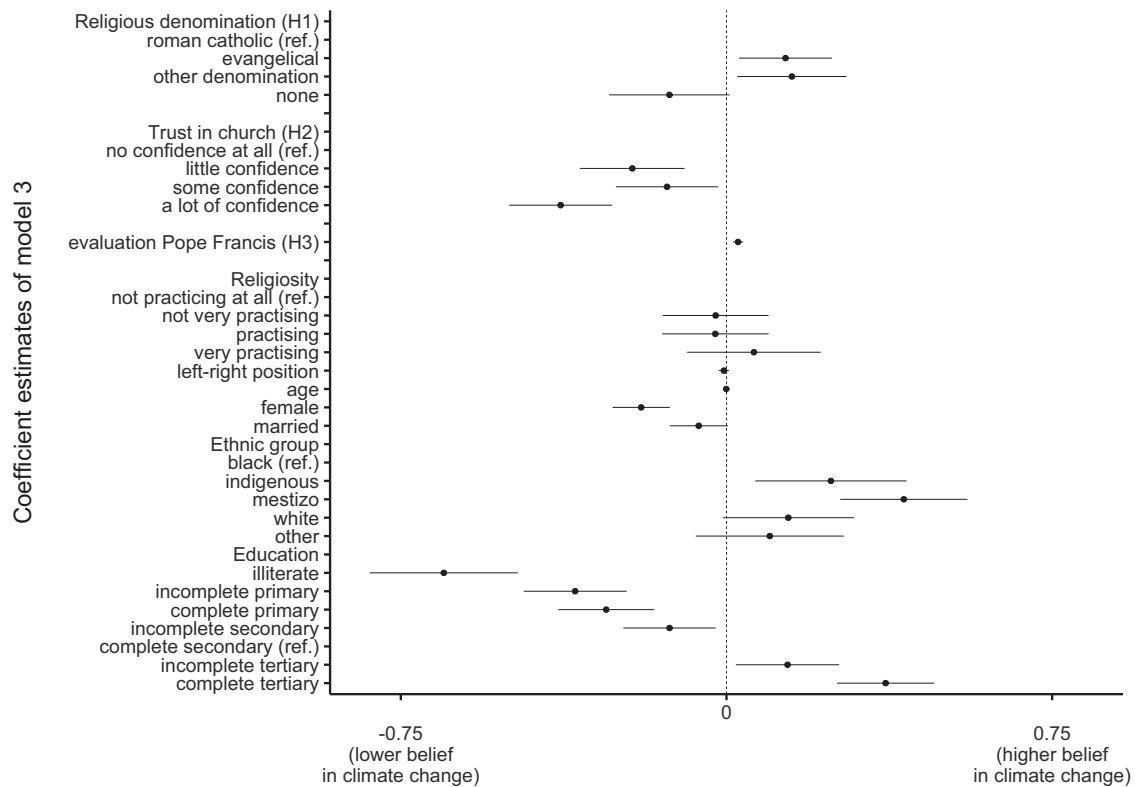


Fig. 2 | Multilevel mixed-effect models of belief in anthropogenic climate change. This figure shows the coefficient estimates of religious denomination, trust in the church as an institution, the evaluation of Pope Francis, religiosity, left-right self-placement and the various control variables on attitudes towards anthropogenic

climate change based on the results of model 3. Positive point estimates increase belief in anthropogenic climate change and negative point estimates decrease belief accordingly. The dark grey bars denote the corresponding 95% confidence intervals. See Supplementary Table 2 for the corresponding model results.

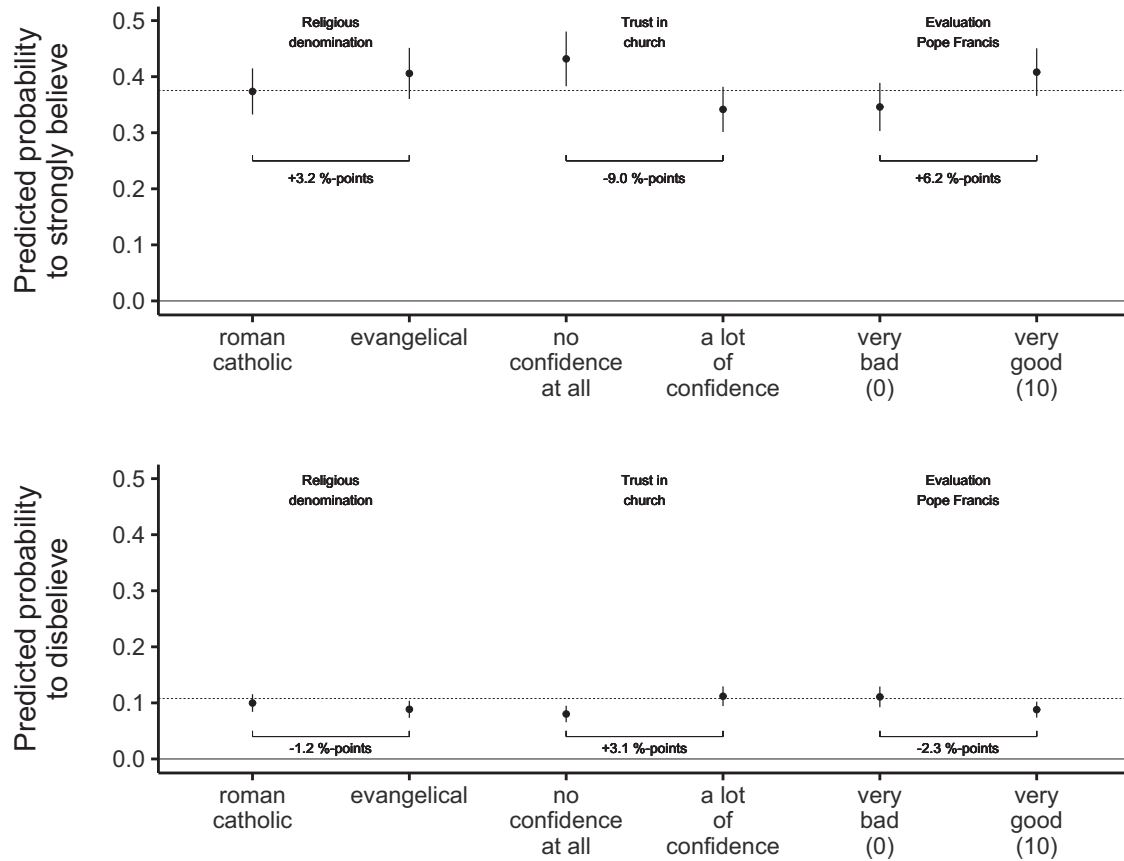


Fig. 3 | Change of predicted probabilities of (dis-)belief in anthropogenic climate change. This figure shows the adjusted predicted probabilities (at representative values and based on the results of model 3) to strongly agree (upper panel) and to disagree (lower panel) to the statement that human beings are the main responsible for climate change for the three key characteristics of theoretical interest, i.e.

religious denomination, trust in the church, and the evaluation of Pope Francis. The dark grey bars denote the corresponding 95% confidence intervals. The dashed horizontal lines show the naïve non-parametric prediction for both outcome categories, based solely on its empirical distribution in our sample.

respondents’ individual attitudes towards anthropogenic climate change ($\chi^2 = 53.10$ and $p < 0.001$). Finally, the analysis corroborates Hypothesis 3 of an alleged “Francis Effect” on attitudes towards climate change. Specifically, the corresponding model coefficient indicates that respondents who evaluate Pope Francis more positively are significantly more likely to embrace the notion of human activities and their responsibility for climate change.

Turning to the effect of the various control variables, the results in Fig. 2 indicate that several additional individual-level characteristics likewise affect the propensity to believe in anthropogenic climate change. Consistent with previous findings on the effect of education, we observe that respondents with higher levels of education are more likely to believe in human responsibility for climate change. For instance, the model results indicate that respondents with completed tertiary education are significantly more likely to agree with the statement that human activities are responsible for climate change than are respondents with completed secondary education only (reference category). Contrary to previous findings on the effect of gender, however, we observe that female respondents are less likely to believe in anthropogenic climate change^{31,44}.

What is particularly interesting for the present analysis is that the model results suggest that the respondents’ commitment to their religious beliefs has no effect on belief in anthropogenic climate change, once we account for their trust in the Church and their evaluation of Pope Francis. This finding corroborates our assertion that the linkage between religion and environmental attitudes does not result from the personal confrontation with one’s own faith but is largely determined by the corresponding institutional setting and the institution’s doctrine on climate change.

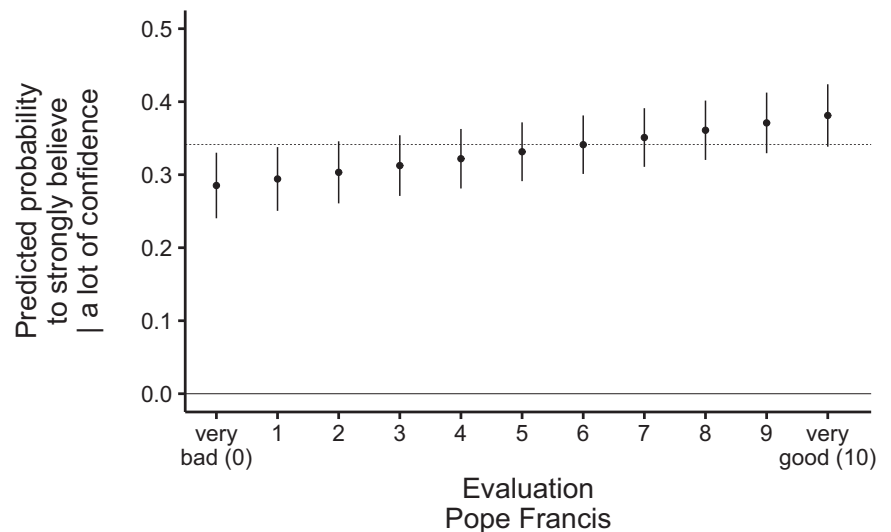
While the empirical results highlight the significant impact of various religion-related characteristics, the model’s generalised linear formulation

makes it difficult to judge their substantive effect on denial of anthropogenic climate change. Consequently, Fig. 3 displays adjusted predicted probabilities for different values of the three key independent variables with all other covariates at their modal and median values, respectively. Specifically, the upper figure shows how these features affect the likelihood of strongly agreeing that climate change is caused by human activity. In contrast, the lower figure shows predicted probabilities to reject said notion. The dashed horizontal lines show the naïve non-parametric prediction for both outcome categories, based solely on their empirical distribution in our sample.

Starting with the upper Fig. 3, respondents who self-identify as evangelical Christians are more likely to strongly agree that climate change is manmade by 3.2 percentage points compared to Roman Catholics. In contrast, high trust in the Church reduces said likelihood by 9.0 percentage points compared to respondents with no trust. Thus, while religious denomination significantly affects attitudes towards climate change, trust in the Church seems to be the more significant determinant. Finally, the upper Fig. 3 shows the adjusted predicted probabilities for respondents depending on their evaluation of Pope Francis. Here, respondents who evaluate the Pope’s performance very positively are about 6.2 percentage points more likely to strongly agree that human beings are the main actor responsible for climate change compared to citizens with very negative evaluations.

The same pattern in terms of substantive empirical effects materialises in the lower Fig. 3 when exploring the impact of religious denomination, trust in the Church, and evaluation of Pope Francis on the likelihood to reject the notion that climate change is anthropogenic. Here, trust also has approximately three times the (absolute) effect that religious denomination does, while the Pope Francis effect lies between the two (approximately twice as large as the effect of religious denomination).

Fig. 4 | Conditional effect of trust in Church for different evaluations of Pope Francis. This figure shows the adjusted predicted probabilities (at representative values and based on the results of model 4) to strongly agree to the statement that human beings are the main responsible for climate change given a lot of confidence in the church over different evaluations of Pope Francis. The dark grey bars denote the corresponding 95% confidence intervals. The dashed horizontal line shows the average unconditional effect of trust in the church based on the results of the linear model 3.



Moderating effect of evaluations of Pope Francis

Having explored the unconditional hypotheses 1 to 3, we finally explore the potential moderating effect of the respondents' evaluation of Pope Francis on trust in the Church and its impact on attitudes towards anthropogenic climate change, in model 4 in Table A.2. The empirical results corroborate our theoretical assertion that both these religious factors jointly affect respondents' attitudes. Specifically, an increasingly affirmative evaluation of Pope Francis significantly attenuates the negative effect of trust in the Church on believing in manmade climate change. Put differently, the more positive a respondent's image of Pope Francis, the more likely they are to acknowledge the effect of human activity on global warming, even if they trust the Church unconditionally.

Figure 4 plots the adjusted predicted probabilities to strongly agree that global warming is anthropogenic for respondents who have a lot of confidence in the Church (on the y -axis), depending on their evaluation of Pope Francis (on the x -axis). As we can see, trusting respondents who critically evaluate the Pope's performance (conceiving of it as "very bad") are significantly and considerably less likely to acknowledge the role of humankind in climate change than are trusting respondents who evaluate Pope Francis very positively (conceiving of him and his performance as "very good"). To be precise, their probability to strongly agree that human beings are the main actor responsible for climate change increases by 10 percentage points, from 28 to around 38%. Overall, the Pope Francis effect thus considerably moderates the institutional trust effect on attitudes towards anthropogenic climate change.

In sum, the empirical analysis of the four hypotheses reveals that we can reject the first two, which postulate positive relationships between believing in anthropogenic climate change, self-identifying as a Roman Catholic, and finding the Church trustworthy. The remaining two hypotheses, on the unconditional positive effect of one's evaluation of Pope Francis and the moderating effect of one's evaluation of the Pope, we can confirm.

Robustness of results

We further explore the robustness of our key findings in two ways. First, we perform a leave-one-out jack-knife analysis to make sure that our empirical findings are not driven by respondents in a single country. Of course, Latin America is quite heterogeneous in terms of its history of colonisation and the role of the Roman Catholic Church therein. Accordingly, we repeatedly re-estimate model 4 and leave out respondents from one country in each re-estimation. Overall, the results of this additional analysis in Supplementary Table 3 suggest that our key findings are not an artefact of country-specific effects. In fact, our two main empirical findings hold across all the 18

additional re-estimations. Secondly, we explore whether the Pope Francis effect identified above is particularly strong among respondents in Argentina. As he is both a prominent spiritual and political figure in his home country, one might expect the effect to be stronger there. However, the results of the additional empirical analysis in model 5 do not corroborate this assertion, finding no significant differences in the Pope Francis effect between respondents in Argentina and the other countries in our sample. Again, this underscores the robustness of our main findings across all the Latin American countries we analysed.

Discussion

Of the empirical findings presented above, three insights stand out as being particularly worth noting and reflecting on. The first of them refers to the negative relationship between self-identifying as Roman Catholic and believing in anthropogenic climate change. As discussed in the theory section, there is a clear indication that the mainstream Roman Catholic Church has been supportive of environmental and climate action. Nonetheless, compared to evangelical Christians and people who do not belong to any denomination or to a different one, Catholics are less likely to believe in manmade global warming. We can think of several reasons why.

One draws on the analysis by Wilkins³³, who showed that in the United States few members of the Catholic clergy substantively engage with environmental issues. Our theoretical reasoning departed from the notion that the Roman Catholic Church is a deeply hierarchical institution, in which priests follow the doctrines defined in the Vatican. However, priests and deacons have substantial leeway in their day-to-day practice of Catholicism³³. If the interactions between Roman Catholics and the Roman Catholic Church take place mostly or exclusively via priests, it is possible that their opinions on environmental and climate issues are not shaped by the Roman Catholic Church as an institution but by those of local priests, who may disagree with the views of the Vatican. Another possibility is that it may simply take local priests time to stimulate the active engagement of their parish with climate issues. This knowledge gap entails a promising perspective for future research that could focus on the positions of local priests on climate change and the degree to which they concur with the views of the Pope.

The second noteworthy observation is that our findings support previous findings showing that in Latin America, evangelical and Pentecostal affiliation and church attendance are not associated with reduced environmental concern²⁹. In light of this, it appears promising to assess in greater detail why evangelical Christians in Latin America seem to have different views on ecological issues than their counterparts in the United States. Such an assessment also appears rewarding since pertinent research has argued

that one of the reasons why the former Brazilian president Jair Bolsonaro rejected climate policy was the support he received from evangelical groups (see, e.g., ref. ⁴⁵). In this context, Smith and Veldman²⁹ suggest that there exist differences across countries in how climate change is framed, which may explain this finding. Not only from a public opinion perspective but also—and perhaps even more so—from a public policy perspective, there is a need to better understand the role of evangelical Protestantism in individual- or state-driven climate action.

The third salient observation is the differences revealed regarding the effectiveness of the intermediation of the Church as an institution and the Pope as its leader. The fact that individuals can also function as important (climate) intermediaries has received little explicit attention so far. It has been studied implicitly, especially by scholars focusing on how leaders of faith-based organisations shape climate action (e.g. refs. ^{13,14}). However, policy studies on intermediaries could certainly benefit from investigating the impact of organisations vis-à-vis individuals as well as their interactions. From this perspective, there exist many ways in which the present study, which draws on public opinion data, could inform policy-analytical research on climate intermediation.

To analyse how trust in the Roman Catholic Church and the evaluation of Pope Francis affect Latin American attitudes towards anthropogenic climate change, we drew on existing research to build a theoretical framework, which in turn enabled us to produce four hypotheses. Using data from a Latinobarómetro survey fielded in 2017, we found that, despite persuasive theoretical reasoning, Catholics are less likely to believe in anthropogenic climate change than evangelical Christians or individuals who belong to another denomination or to none at all. Crucially, trust in the Church was found to reduce the likelihood of believing in it, too. However, we could show that a “Pope Francis Effect” exists, since respondents who support him have a higher likelihood of believing in anthropogenic climate change. This effect also moderates the negative relationship between the outcome variable and trust in the Church. This supports existing research on the “Pope Francis Effect”^{7,8} and substantiates it through the country-comparative nature of the data we used; it also resonates with the “contextual turn” in the study of how institutionalised doctrines affect attitudes towards issues related to climate change and the environment given different country contexts²⁹. We can only agree with other authors who call for an improved understanding of the role played by seemingly universal doctrines in different cultural, social, and political contexts. The current literature draws heavily on research on the U.S. and to a more limited degree on the Canadian public (see, e.g., ref. ⁴⁰), which is instructive, of course, but does not vary the context for testing the hypotheses, or at least not to a strong degree.

Despite the constraints inherent in using an existing dataset, our study has been revealing, both empirically and conceptually. Empirically, we have offered a test of the intermediation effects of the Church as an institution and the Pope as an individual as well as how they are interrelated. Conceptually, we have tried to enhance the general understanding of faith-based climate intermediaries by concentrating on the Roman Catholic Church. Given the figure of Pope Francis and his interventions calling for climate action, the Roman Catholic Church appeared a logical choice for this analysis. From this conceptual consideration followed the empirical setting in which we tested our hypotheses, with respondents based in 18 countries in Latin America.

Nonetheless, there are inevitable limits to our findings, but we see these primarily as starting points for further research. First, we have investigated a dataset dating back to 2017. Considering the COVID-19 pandemic, which broke out in December 2019, severely affected several Latin American countries and the political developments in countries such as Venezuela or Peru, we cannot be sure whether climate change remains a priority among Latin Americans. Likewise, the influence of evangelicalism has been growing, which could also affect the relationships observed here. Most importantly, however, we were forced to rely on very few items to test our hypotheses, as we did not have the means to design and administer an original survey. While this would be feasible for one or a few countries, achieving a geographical coverage as broad as the Latinobarómetro’s would

entail very high costs. Further studies might build on our findings by investigating in a disaggregated manner whether it is people’s trust in the Church or in their local priests that matters more for attitudes towards climate change. Finally, it would be worth investigating not only attitudes towards anthropogenic climate change but also intended or actual behaviour change (see, e.g., refs. ^{46,47}) in response to the Church’s institutional doctrines.

These research avenues have the potential to expand our understanding of how faith-based intermediaries shape the attitudes of citizens regarding climate change. The next logical step would be to use panel data that capture the multiple occasions on which Pope Francis has called for urgent and ambitious climate action. It is conceivable that the impact of the Pope may be subject to the elapsing of time, as suggested, for example, by Landrum et al.⁴³. The reason for this could be the varying political context in which the Pope has made his calls (see ref. ²²), of which, at the time of writing, the latest one was in the advent of the COP28 in autumn 2023.

A further step forward would be to administer a survey with members of the Catholic clergy, that is, an elite survey, and to ask them about how they perceive of the role of the Church and Pope Francis in shaping individuals’ attitudes towards climate change and climate action. Such a perspective would allow researchers both to check the findings reported in this analysis and to unpack the causal mechanisms of our findings.

Methods

Data and operationalization

We test our four hypotheses using individual-level data gathered from the Latinobarómetro survey from 2017, which encompassed 18 Latin American countries¹⁷. Supplementary Table 1 provides detailed information on the number of respondents per country and the corresponding fieldwork period. These data provide, inter alia, information on respondents’ attitudes towards anthropogenic climate change, their religious denomination, their trust in the Church, and their evaluation of Pope Francis. The outcome variable is operationalised as follows¹⁷: “Please tell me whether you agree with the following statement: Human beings are the main actor responsible for Climate Change”. Respondents can indicate whether they strongly disagree (0), disagree (1), agree (2), or strongly agree (3) with this statement. Since this is a positively keyed (worded) item, we take higher levels of agreement to indicate a higher inclination to believe in anthropogenic climate change.

The first predictor of belief in anthropogenic climate change that we derive from our theoretical considerations is religious denomination. Here, we differentiate between Roman Catholics, evangelical Christians, atheists/agnostics, and other religious denominations (Jewish, Muslim, etc.). The second potential determinant is trust in the Church, which is captured via the following survey item: “Please [...] tell me how much trust you have in each of the following groups/institutions: The Church”. Here, respondents can indicate whether they have no trust (0), a little trust (1), some trust (2), or a lot of trust (3) in the respective institution. The final key explanatory variable is the individual’s evaluation of Pope Francis as leader of the Catholic Church. This is operationalised via the following standard item: “On a scale from 0 to 10, where zero is “very bad” and ten is “very good”, please tell me where would you place Pope Francis.”

We also include various additional characteristics that are potential confounders of the hypothesised empirical relationships between religious denomination, trust in the Church, and belief in anthropogenic climate change. The first of these is religiosity, i.e. the respondents’ level of commitment to their religious beliefs. Indeed, it is plausible to assume that more religious individuals have more trust in the Church and are also more sceptical of manmade climate change⁴¹. Accordingly, we employ an established measure of religiosity in which respondents are asked to indicate whether they are not practising at all (0), hardly practising (1), practising (2), or very regularly practising (3). All respondents who indicate having no religious denomination (~15%) are coded as “not practising at all” (0).

Another potential confounder is the respondents’ political ideology. Existing empirical research on the determinants of climate/environmental

Table 1 | Descriptive statistics

	Strongly agree	Agree	Disagree	Strongly disagree			
Anthropogenic climate change denial	37.53	49.74	10.79	1.94			
Religious denomination	None	Catholic	Evangelical	Other			
	15.02	62.49	13.46	9.03			
Trust in Church	No trust	A little trust	Some trust	A lot of trust			
	13.23	20.13	27.11	39.53			
Religiosity	Not practising at all	Hardly practising	Practising	Very regularly practising			
	26.01	30.10	34.02	9.87			
Gender	Male	Female					
	51.54	48.46					
Marital status	Single/separated	Married/partner					
	47.52	52.48					
Ethnic group	Black	Indigenous	Mestizo	White	Other		
	6.32	9.81	45.75	28.54	9.59		
Education	Illiterate	Incomplete primary	Complete primary	Incomplete secondary	Complete secondary	Incomplete tertiary	Complete tertiary
	4.89	13.05	15.16	17.08	24.58	11.44	13.80
Evaluation Pope Francis	Minimum	Median	Mean	Maximum	Standard deviation		
	0.00	8.00	6.76	10.00	3.17		
Age	16.00	37.00	39.96	95.00	16.05		
Left-right position	0.00	5.00	5.24	10.00	2.90		

This table shows the descriptive statistics for the dependent, the key independent, and all the control variables. Cell entries depict the percent of respondents for each category for the categorical variables and the minimum, median, mean, maximum, and standard deviation for the continuous variables. See the subsection data and methods for detailed information on the question wording and coding of the variables.

attitudes indicates that individuals who hold left ideological positions are consistently more concerned about climate change^{31,38,48}. At the same time, we expect political ideology to affect individual trust in the Church. Consequently, we include a measure of political ideology based on the respondents' self-placement on a general left-right scale, where 0 is left and 10 is right. It is a standard measurement used widely by other surveys, too, such as the European Social Survey.

Finally, we include a series of measures that capture the respondents' demographics and their socio-economic status. Specifically, all empirical models include age (in years), an indicator variable differentiating between male (0) and female (1) respondents, and several categorical variables indicating the respondents' ethnic group (black, indigenous, mestizo, white, other), their marital status, and their highest level of education (seven categories ranging from illiterate [1] to completed tertiary education [7]). After employing list wise deletion to handle missing data, we retained 13,472 respondents for the empirical analysis, which is ~68% of the original sample size.

Descriptive statistics

The descriptive statistics for the outcome of interest, the key predictors, and the other independent variables are shown in Table 1. Starting with belief in anthropogenic climate change, most of the respondents agreed or strongly agreed with the survey statement. Indeed, only 12% of respondents are (strongly) convinced that human beings are not the main actor responsible for climate change. Concerning respondents' religious denomination, more than 60% of the respondents in our sample are Roman Catholic, while less than 15% are evangelical Christians. Turning to trust in the Church, the empirical distribution suggests that almost 40% of respondents have a lot of trust, while ~67% have at

least some trust. These are comparatively high levels of trust. The judiciary, for instance, which is generally perceived as the most impartial national institution in Latin American countries, is trusted by less than 30% of the respondents in our sample. Finally, Latin Americans generally evaluate Pope Francis' performance positively, with a mean score of 6.76 and a median score of 8.

Empirical model

The choice of empirical model specification is guided by (1) the hierarchical data structure and (2) the ordinal nature of the dependent variable. As indicated above, we explore the alleged effect of a series of religious characteristics on the inclination to deny the scientific consensus on global warming in 18 heterogeneous Latin American societies that differ across various unobserved institutional, societal, and cultural characteristics. We thus employ multilevel mixed-effect regression models with fixed-effect estimates at the individual level and random effects at the country level to consider the clustered nature of the data in which respondents are exposed to the political, social, and economic institutions of their country. The empirical model specification likewise reflects the ordinal nature of the outcome variable, in which respondents indicate their attitudes towards anthropogenic climate change on a scale with ordered response categories. Accordingly, the empirical analysis employs an ordered logistic regression model that is estimated via maximum likelihood.

Data availability

The datasets generated during and/or analysed during the current study are available as an open source from Latinobarómetro: <https://www.latinobarometro.org/latContents.jsp>.

Code availability

All script files to replicate the results of the empirical analysis including all tables and figures are available here: <https://doi.org/10.7910/DVN/IOMB11>.

Received: 3 November 2023; Accepted: 8 March 2024;

Published online: 09 April 2024

References

- Glaab, K. A Climate for Justice? Faith-based advocacy on climate change at the United Nations. *Globalizations* **14**, 1110–1124 (2017).
- Hague, A. & Bomberg, E. Faith-based actors as climate intermediaries in Scottish climate policy. *Policy Stud.* **44**, 589–607 (2023).
- Archbishop of Canterbury. A Joint Message for the Protection of Creation. (2021).
- Francis. *Laudato Si: On Care for Our Common Home* (Vatican, 2015).
- Jenkins, W., Berry, E. & Kreider, L. B. Religion and climate change. *Annu. Rev. Environ. Resour.* **43**, 85–108 (2018).
- Landrum, A. R. & Vasquez, R. Polarized U.S. publics, Pope Francis, and climate change: reviewing the studies and data collected around the 2015 Papal Encyclical. *WIREs Clim. Change* **11**, e674 (2020).
- Mrchkovska, N., Dolšák, N. & Prakash, A. Pope Francis, climate message, and meat tax: evidence from survey experiment in Italy. *Npj Clim. Action* **2**, 30 (2023).
- Myers, T. A., Roser-Renouf, C., Maibach, E. & Leiserowitz, A. Exposure to the Pope's climate change message activated convinced Americans to take certain activism actions. *Glob. Chall.* **1**, 4759 (2017).
- Lehtonen, M., Prades, A., Espluga, J. & Arapostathis, S. Introduction to the special issue "Trust, mistrust, distrust, and trust-building in the nuclear sector: historical and comparative experience from Europe". *J. Risk Res.* **25**, 547–561 (2022).
- Maman, L., Feldman, Y. & Levi-faur, D. Varieties of regulatory regimes and their effect on citizens' trust in firms. *J. Eur. Public Policy* **30**, 2807–2831 (2023).
- Abbott, K. W., Levi-faur, D. & Snidal, D. Theorizing regulatory intermediaries. *Ann. Am. Acad. Pol. Soc. Sci.* **670**, 14–35 (2017).
- Kivimaa, P., Boon, W., Hyysalo, S. & Klerkx, L. Towards a typology of intermediaries in sustainability transitions: a systematic review and a research agenda. *Res. Policy* **48**, 1062–1075 (2019).
- Tosun, J., Tobin, P. & Farstad, F. M. Intermediating climate change: conclusions and new research directions. *Policy Stud.* **44**, 687–701 (2023).
- Tobin, P., Farstad, F. M. & Tosun, J. Intermediating climate change: the evolving strategies, interactions and impacts of neglected "climate intermediaries". *Policy Stud.* **44**, 555–571 (2023).
- Bomberg, E. & Hague, A. Faith-based climate action in Christian congregations: mobilisation and spiritual resources. *Local Environ.* **23**, 582–596 (2018).
- Kidwell, J., Ginn, F., Northcott, M., Bomberg, E. & Hague, A. Christian climate care: slow change, modesty and eco-theo-citizenship. *GEO Geogr. Environ.* **5**, 414 (2018).
- Latinobarómetro. *Latinobarómetro Database* (Latinobarómetro, 2017).
- Bohigues, A. & Rivas, J. M. Nobody is a prophet in their own land? Evaluations of Pope Francis in Latin America. *Bull. Lat. Am. Res.* **40**, 133–148 (2021).
- Roldán, V. Pope Francis and Argentinean politics. in *Research in the Social Scientific Study of Religion*, Vol. 30 (eds Hood, R. W. & Cheruvallil-Contractor, S.) 295–313 (Brill, 2019).
- Lachapelle, E., Borick, C. P. & Rabe, B. Public attitudes toward climate science and climate policy in federal systems: Canada and the United States compared. *Rev. Policy Res.* **29**, 334–357 (2012).
- Morrison, M., Duncan, R. & Parton, K. Religion does matter for climate change attitudes and behavior. *PLoS ONE* **10**, e0134868 (2015).
- Djupe, P. A. & Burge, R. P. Divine attribution? The interaction of religious and secular beliefs on climate change attitudes. *Polit. Relig.* **16**, 110–128 (2023).
- Haluza-DeLay, R. Religion and climate change: varieties in viewpoints and practices. *WIREs Clim. Change* **5**, 261–279 (2014).
- Cárdenas, M., Bonilla, J. P. & Brusa, F. *Climate Policies in Latin America and the Caribbean: Success Stories and Challenges in the Fight against Climate Change* (Inter-American Development Bank, 2021).
- Bodansky, D. The legal character of the Paris agreement. *Rev. Eur. Community Int. Environ. Law* **25**, 142–150 (2016).
- Boas, T. C. The electoral representation of Evangelicals in Latin America. in *Oxford Research Encyclopedia of Politics*, (ed. Thompson, W. R.) (Oxford University Press, 2020). <https://doi.org/10.1093/acrefore/9780190228637.013.1748>.
- Carr, W. A., Patterson, M., Yung, L. & Spencer, D. The faithful skeptics. *J. Study Relig. Nat. Cult.* **6**, 276–299 (2012).
- Veldman, R. G. *The Gospel of Climate Skepticism: Why Evangelical Christians Oppose Action on Climate Change* (University of California Press, 2019).
- Smith, A. E. & Veldman, R. G. Evangelical environmentalists? Evidence from Brazil. *J. Sci. Study Relig.* **59**, 341–359 (2020).
- Mar, K. A., Unger, C., Walderdorff, L. & Butler, T. Beyond CO2 equivalence: the impacts of methane on climate, ecosystems, and health. *Environ. Sci. Policy* **134**, 127–136 (2022).
- McCright, A. M. & Dunlap, R. E. Cool dudes: the denial of climate change among conservative white males in the United States. *Glob. Environ. Change* **21**, 1163–1172 (2011).
- Wong-Parodi, G. & Feygina, I. Understanding and countering the motivated roots of climate change denial. *Curr. Opin. Environ. Sustain.* **42**, 60–64 (2020).
- Wilkins, D. Catholic clerical responses to climate change and Pope Francis's *Laudato Si'*. *Environ. Plan. E Nat. Space* **5**, 146–168 (2022).
- Tobin, P., Ali, N., MacGregor, S. & Ahmad, Z. "The religions are engaging: tick, well done": the invisibilization and instrumentalization of Muslim climate intermediaries. *Policy Stud.* **44**, 627–645 (2023).
- Nche, G. C. The Church climate action: identifying the barriers and the bridges. *Transform. Int. J. Holist. Mission Stud.* **37**, 222–241 (2020).
- White, L. The historical roots of our ecologic crisis. *Science* **155**, 1203–1207 (1967).
- Arbuckle, M. B. The interaction of religion, political ideology, and concern about climate change in the United States. *Soc. Nat. Resour.* **30**, 177–194 (2017).
- Arbuckle, M. B. & Konisky, D. M. The role of religion in environmental attitudes. *Soc. Sci. Q.* **96**, 1244–1263 (2015).
- Konisky, D. M. The greening of Christianity? A study of environmental attitudes over time. *Environ. Polit.* **27**, 267–291 (2018).
- Hayhoe, D., Bloom, M. A. & Webb, B. S. Changing evangelical minds on climate change. *Environ. Res. Lett.* **14**, 024016 (2019).
- Leiserowitz, A. A., Maibach, E. W., Roser-Renouf, C., Smith, N. & Dawson, E. Climategate, public opinion, and the loss of trust. *Am. Behav. Sci.* **57**, 818–837 (2013).
- Jennings, F. J. & Russell, F. M. Civility, credibility, and health information: the impact of uncivil comments and source credibility on attitudes about vaccines. *Public Underst. Sci.* **28**, 417–432 (2019).
- Landrum, A. R., Lull, R. B., Akin, H., Hasell, A. & Jamieson, K. H. Processing the papal encyclical through perceptual filters: Pope Francis, identity-protective cognition, and climate change concern. *Cognition* **166**, 1–12 (2017).
- Krange, O., Kaltborn, B. P. & Hultman, M. Cool dudes in Norway: climate change denial among conservative Norwegian men. *Environ. Sociol.* **5**, 1–11 (2019).
- De Sá Guimarães, F. et al. The evangelical foreign policy model: Jair Bolsonaro and evangelicals in Brazil. *Third World Q.* **44**, 1324–1344 (2023).

46. Belaïd, F. & Joumni, H. Behavioral attitudes towards energy saving: empirical evidence from France. *Energy Policy* **140**, 111406 (2020).
47. Lévy, J.-P. & Belaïd, F. The determinants of domestic energy consumption in France: energy modes, habitat, households and life cycles. *Renew. Sustain. Energy Rev.* **81**, 2104–2114 (2018).
48. Lacasse, K. The importance of being green: the influence of green behaviors on Americans' political attitudes toward climate change. *Environ. Behav.* **47**, 754–781 (2015).
49. WorldData.info. Catholic Churches. <https://www.worlddata.info/religions/catholics.php> (2023).

Acknowledgements

We thank Laurence Crumbie and all panelists at the Latin American Studies Association Congress (2022) and the HCIAS Colloquium at Heidelberg University (2022) for their comments. Barbara Ladenburger, Lucas Leopold, and Ana Souto Miebach deserve credit for research assistance. F.N. and J.T. acknowledge funding from the Marsilius Kolleg as well as the Field of Focus 3 and Field of Focus 4 at Heidelberg University. J.T. acknowledges funding from the ERC (via the DeepDCarb Advanced Grant No. 882601). For further details, see the DeepDCarb website (<https://www.deepdcarb.org>). For the publication fee, we acknowledge financial support by Heidelberg University.

Author contributions

Alejandro Ecker: data curation, methodology, software, formal analysis, visualisation, investigation, writing—original draft preparation. Friederike Nüssel: conceptualisation, funding acquisition, resources, writing—reviewing and editing. Jale Tosun: conceptualisation, funding acquisition, methodology, investigation, project management, resources, writing—original draft preparation.

Funding

Open Access funding enabled and organized by Projekt DEAL.

Competing interests

All authors declare no financial or non-financial competing interests. J.T. discloses that she is the editor-in-chief of npj Climate Action. However, she was not involved in the review process. The manuscript was handled in the same way as any other submission to the journal.

Additional information

Supplementary information The online version contains supplementary material available at <https://doi.org/10.1038/s44168-024-00109-1>.

Correspondence and requests for materials should be addressed to Alejandro Ecker.

Reprints and permissions information is available at <http://www.nature.com/reprints>

Publisher's note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

© The Author(s) 2024