

Editor Choice

Processing the papal encyclical through perceptual filters: Pope Francis, identity-protective cognition, and climate change concern



Asheley R. Landrum^{a,b,*}, Robert B. Lull^{a,c}, Heather Akin^a, Ariel Hasell^a, Kathleen Hall Jamieson^a

^a Annenberg Public Policy Center, University of Pennsylvania, United States

^b College of Media & Communication, Texas Tech University, United States

^c Department of Communication, California State University, Fresno, United States

ARTICLE INFO

Article history:

Received 21 September 2016

Revised 10 May 2017

Accepted 12 May 2017

Keywords:

Credibility

Climate change cognition

Polarized science

Identity-protective cognition

Laudato si'

Pope Francis

ABSTRACT

Previous research suggests that when individuals encounter new information, they interpret it through perceptual 'filters' of prior beliefs, relevant social identities, and messenger credibility. In short, evaluations are not based solely on message accuracy, but also on the extent to which the message and messenger are amenable to the values of one's social groups. Here, we use the release of Pope Francis's 2015 encyclical as the context for a natural experiment to examine the role of prior values in climate change cognition. Based on our analysis of panel data collected before and after the encyclical's release, we find that political ideology moderated views of papal credibility on climate change for those participants who were aware of the encyclical. We also find that, in some contexts, non-Catholics who were aware of the encyclical granted Pope Francis additional credibility compared to the non-Catholics who were unaware of it, yet Catholics granted the Pope high credibility regardless of encyclical awareness. Importantly, papal credibility mediated the conditional relationships between encyclical awareness and acceptance of the Pope's messages on climate change. We conclude by discussing how our results provide insight into cognitive processing of new information about controversial issues.

© 2017 Elsevier B.V. All rights reserved.

1. Introduction

"People who complain that all that [Pope Francis] has done thus far is more style than substance are missing their Marshall McLuhan, that "the medium is the message. . ." He is clearly a man of the people, and the people are responding in kind."

[Catholic Deacon William T. Ditewig, Ph.D. (2013).]

Written only weeks after Pope Francis's papacy began, Deacon William Ditewig's words remain remarkably prophetic as the Pope has repeatedly offered an influential voice on a variety of issues, ranging from the plights of refugees to diplomatic relations between the United States and Cuba. His popularity, resonating as much with general populations of Catholic constituents (e.g., Europe, United States, Latin America; see [Pew Research Center, 2014a](#)) as with A-list public figures (e.g., Leonardo DiCaprio, Oprah Winfrey; see [Asay, 2016](#)), has crystallized into a sort of celebrity status as "The People's Pope" ([Chua-Eoan & Dias, 2013](#)).

* Corresponding author at: College of Media & Communication, Texas Tech University, United States.

E-mail address: landrumar@gmail.com (A.R. Landrum).

The long history of celebrity appeals suggests that popular figures can leverage their own status to raise awareness and motivate action (see [Hoffman & Tan, 2013](#)).¹ A few months prior to the watershed Paris Climate Conference² of 2015, Pope Francis issued his own "celebrity" appeal urging global action toward climate change mitigation. His papal encyclical,³ *Laudato si': On Care for Our Common Home* ([Francis, 2015](#)), was released in June 2015 to much fanfare from climate change mitigation advocates. The effect of the document hinged largely on Pope Francis leveraging his moral authority to influence public opinion on issues related to climate change. In particular, *Laudato si'* advanced the message that there

¹ Such appeals do not always coincide with scientific evidence; controversies surrounding vaccines and genetically modified organisms demonstrate that celebrity appeals can succeed in direct conflict with scientific consensus ([Caulfield & Fahy, 2016](#)).

² The Paris Climate Conference resulted in an agreement within the United Nations Framework Convention on Climate Change that aimed, among other things, to hold the increase in global average temperatures to less than 2 °C above pre-industrial levels. The United States signed the agreement on April 22, 2016.

³ A papal encyclical is a letter concerning Catholic doctrine written by the Pope and typically disseminated among bishops and Church leadership. *Laudato si'* was notable for, among other things, addressing the entire global population rather than just Catholic leadership ([Goodstein & Gillis, 2015](#)).

is a moral imperative to act to address climate change because, among other reasons, it threatens God's creation and disproportionately affects the poor and vulnerable. Advocates for climate change mitigation hoped that this moral appeal by the popular leader (see [Pew, 2014b](#)) of a socially-conservative religious institution would increase climate change concern among U.S. conservatives in general and Catholic conservatives in particular.

Was *Laudato si'* effective? Previous research demonstrated that, while Pope Francis may have amplified perceptions that climate change is a moral issue, American climate change attitudes remain polarized along party ideology after the release of *Laudato si'* ([Li, Hilgard, Scheufele, Winneg, & Jamieson, 2016](#); [Schuldt, Pearson, Romero-Canyas, & Larson-Konar, 2017](#)). In this study, we examine *Laudato si'* in the framework of climate change cognition. Specifically, we ask whether awareness of the 2015 encyclical influenced beliefs about two of the pope's arguments: the seriousness of climate change and the effects of climate change on the poor, and whether perceptions of papal credibility on climate change mediated these relationships. We also predicted that political ideology and Catholicism would moderate the influence of awareness, given the role that group membership and prior values play in both source credibility assessments (e.g., [Landrum, Eaves, & Shafto, 2015](#)) and beliefs about controversial science (e.g., [McCright & Dunlap, 2011](#); [Brossard, Scheufele, Kim, & Lewenstein, 2009](#)).

1.1. The role of credibility assessments

Despite the strong consensus among expert climate scientists that human-caused global warming is happening and that it presents a global threat (e.g., [Anderegg, Prall, Harold, & Schneider, 2010](#)), there is still a sizeable population of climate change skeptics in the U.S. These skeptics' concerns range from complex and debatable questions (e.g., the economic viability of various responses to climate change) to conspiratorial beliefs impugning climate scientists' values and motives ([Lewandowsky, Gignac, & Oberauer, 2013](#)). Such beliefs can be especially damaging to climate science specifically—and arguably the process of science broadly—by undermining researcher credibility and trustworthiness. If climate scientists lack credibility and trustworthiness among large segments of the population, more substantive political debates about economics and solutions are nonstarters while scientists instead struggle to engender public acceptance of unimpeachable scientific findings.

The process of making judgments about the credibility and trustworthiness of communicators (and sources in general) is also known as epistemic trust (e.g., [Hendriks, Kienhues, & Bromme, 2016](#); [Koenig & Harris, 2005](#); [Landrum, Mills, & Johnston, 2013](#); [Shafto, Eaves, Navarro, & Perfors, 2012](#); [Wilholt, 2013](#)). When audiences evaluate a communicator's credibility or trustworthiness, they often do so based both on their perceptions of that communicator's expertise, or competence, (truth-relevant criteria) and their judgment that the communicator shares their cultural beliefs and values (group-congenial criteria; [Fiske & Dupree, 2014](#); [Lupia, 2016](#)). In many cases, despite sound reasons to perceive communicators as experts, audiences instead doubt the trustworthiness of those sources based on group-congenial criteria, suggesting that this social dimension may be more important for credibility assessments than expertise (e.g., [Clark & Maass, 1988](#); [Landrum et al., 2013](#); [White, 2005](#)).

When interacting with a communicator, audiences update their prior beliefs along two paths that jointly influence one another over time ([Landrum et al., 2015](#)). While people use their perceptions of a communicator's credibility, such as beliefs about that persons' knowledge and motivations, to influence how they perceive a message, they also use information contained in the message to update their beliefs about the messenger's credibility

([Landrum et al., 2015](#)). This further underscores the notion that audiences evaluate information not only on how likely it is to be accurate, but also on the extent to which it reflects their own cultural values and the cultural values of the source ([Kahan, Braman, Cohen, Gastil, & Slovic, 2010](#)).

The important point to note here is that credibility assessments are not necessarily consistent across domains nor are they stable over time. Although Pope Francis might be granted credibility in the context of compassion for the poor, we expected that he would be granted less credibility in the context of climate change solutions. Moreover, it is possible that by attempting to influence public opinion on a polarizing social issue like climate change, Pope Francis may have undermined his own credibility, particularly among those who—because of their group affiliations and worldviews—are predisposed to be skeptical of messages concerning the causes and consequences of climate change.

1.2. The role of identity-protective cognition: Priors and group membership

As previously mentioned, audiences may decrease or increase perceived credibility of a figure based on the extent to which communicated information is group—or identity—congenial. When information or evidence comes into conflict with worldviews or identities, people often engage in “identity-protective cognition” ([Kahan, Braman, Gastil, Slovic, & Mertz, 2007](#)), a type of motivated reasoning ([Kunda, 1990](#)). Identity-protective cognition can involve reactions such as moderating risk perceptions ([Kahan et al., 2012](#)) or reducing credibility assessments of sources.

The extent to which information is identity-congenial can be evaluated in many ways, including whether the information agrees or conflicts with people's “priors” (i.e., prior values, beliefs, goals, and affective judgments), or whether that communicator is perceived to be an in-group member.

1.2.1. Priors

Priors operate as perceptual filters through which new information is interpreted ([Jackson & Hogg, 2010](#)). The importance of priors in evaluating novel scientific information has been demonstrated in risk and benefit perceptions of topics such as nanotechnology ([Brossard et al., 2009](#); [Liang et al., 2015](#)), embryonic stem cell research ([Ho, Brossard, & Scheufele, 2008](#)), and the Human Papillomavirus (HPV) vaccine ([Kahan et al., 2010](#)). Specifically, individuals are more likely to accept information that fits their priors (confirmation bias, [Nickerson, 1998](#)) and dismiss information that conflicts with their priors ([Lord, Ross, & Lepper, 1979](#)).

Importantly, having different priors can lead to different interpretations of the same information. For instance, when provided with the same information about the risks and benefits of nanotechnology, individuals who value market autonomy grant more weight to the benefits and individuals who are more skeptical of market autonomy grant more weight to the risks ([Kahan, Braman, Slovic, Gastil, & Cohen, 2009](#)). Similar effects have occurred in the context of climate change: politically conservative individuals (who tend to favor market autonomy and eschew government intervention) are suspicious about the existence of climate change and rate it as low risk. In contrast, politically liberal individuals (who tend to favor social equity and are suspicious of industry) express more climate change concern and rate climate change as high risk ([Dunlap & McCright, 2008](#); [Kahan et al., 2012](#); [McCright & Dunlap, 2011](#)).

1.2.2. Group membership

Group membership also influences how information is processed ([Baumeister & Leary, 1995](#)) as predicted by social identity theory (e.g., [Tajfel & Turner, 1979](#); see also [Turner & Oakes,](#)

1989). People conform to the group norms of the social-category to which they see themselves as belonging (i.e., social identification), including the espousal of the groups' beliefs and values (e.g., Bettencourt & Hume, 1999; Cohen, 2003; Tajfel & Turner, 1979). Moreover, people often compare their groups to other groups and act in ways that favor in-group members and oppose out-group members (Tajfel, Billig, Bundy, & Flament, 1971).

These in-group versus out-group designations can act as heuristics for information processing. For example, people who are aware that presented information comes from an in-group member accept the information regardless of quality, whereas people aware that presented information comes from outgroup members reject the information even when argument quality is strong (Mackie, Gastardo-Conaco, & Skelly, 1992). Cohen, too, found across four experiments that group membership (e.g., political party) was highly influential on persuasion, but also that people were blind to its influence (Cohen, 2003). For example, when presented with information about a welfare policy, participants accepted the policy position as their own when it was described as being supported by someone in their political party, regardless of whether the policy actually aligned with democratic (i.e., more lenient) or republican (i.e., more stringent) views. However, when experimenters did not mention support from a party member, participants supported the policy based on whether the content of the policy aligned with their political viewpoints (Cohen, 2003).

Taken together, these literatures suggest that different groups with different priors will interpret the papal encyclical in different ways. In particular, we anticipated that political ideology and Catholic affiliation would be influential group memberships given the social meanings of climate change.

1.3. The social meanings of climate change

The social meaning of an issue is the compatibility of that issue with a group's social values (Cohen, 2003). Climate change is laden with social meaning; it is not merely a scientific or environmental issue, but one that has become tightly connected to people's views about political issues such as government regulation and social issues such as concern for the poor.

Largely because proposed climate change solutions often involve stricter energy regulations and diminishing fossil fuel use, there are huge gaps between liberal democrats and conservative republicans on climate policy and climate science. For instance, a recent survey by Pew Research Center shows that 79% of liberal democrats believe that the Earth is warming due to human activity compared to only 15% of conservative republicans (Funk & Kennedy, 2016). Likewise, 70% of liberal democrats trust climate scientists to give "full and accurate information about the causes of climate change" compared to only 15% of conservative republicans, and conservative republicans are more likely than liberal democrats to say that climate science findings are influenced by the scientists' "desire to advance their careers" (57% vs. 16%) or their own political leanings (54% vs. 11%; Funk & Kennedy, 2016). Therefore, it is unsurprising that the two party platforms recommend different climate policies. The 2016 Republican platform, for instance, opposed any carbon tax (p. 20), denounced environmental science as "shoddy" (p. 21), recommended forbidding the Environmental Protection Agency (EPA) from regulating carbon dioxide (p. 21), and rejected the agendas of both the Kyoto Protocol⁴ and Paris Agreement (p. 22). In contrast, the 2016 Democratic platform, in addition to having a full section devoted to combating climate change, building a clean energy and

economy, and securing environmental justice (pg. 25), the platform stresses climate change concern in the preamble:

Democrats believe that climate change poses a real and urgent threat to our economy, our national security, and our children's health and futures, and that Americans deserve the jobs and security that come from being the clean energy superpower of the 21st century. (pg. 2)

Therefore, we anticipate that conservative ideology will negatively influence beliefs about the seriousness of climate change and its effects on the poor. In addition, because values can influence not just perception of the messages, but of the messenger, we anticipate that conservative ideology will negatively influence perceptions of papal credibility.

Political parties are not the only groups that have taken strong stances on climate change. Some religious organizations, such as the National Association of Evangelicals and the United Church of Christ, have publicly supported climate change mitigation with recent policy documents (2015). In contrast, supporters of Christian end-times theology are the least likely to support climate change mitigation policies, and the Southern Baptist Convention has released climate change skeptical policy resolutions in recent years (Barker & Bearce, 2013; Zaleha & Szasz, 2015).

The Catholic Church has taken a stance on climate change even prior to Pope Francis's papacy. In 2001, the United States Conference of Catholic Bishops, for example, issued a statement that presented a moral perspective on climate change:

As Catholic bishops, we seek to offer a distinctively religious and moral perspective to what is necessarily a complicated scientific, economic, and political discussion. Ethical questions lie at the heart of the challenges facing us. John Paul II insists, 'We face a fundamental question which can be described as both ethical and ecological. How can accelerated development be prevented from turning against man? How can one prevent disasters that destroy the environment and threaten all forms of life, and how can the negative consequences that have already occurred be remedied?' (Catholic Church, 2001).

The Global Catholic Climate Movement frames climate change's social meaning for Catholics in terms of the threat that climate change poses to human life. The organization specifies that the Catholic Church is consistently pro-life, that the harmful effects of climate change "directly threaten the Church's commitment to protect and defend human life and dignity", and that shifting to cleaner and renewable energy is a "critical pro-life issue" (Global Catholic Climate Movement, 2017).

Therefore, we expect that Catholic affiliation should positively influence beliefs about the seriousness of climate change and its effects on the poor in addition to perceptions of papal credibility, which should, in turn, lead to greater agreement with the pope's messages.

Given climate change's social meaning among political and religious groups and the importance of group-relevant priors in processing new information, the release of *Laudato si'* offered an interesting research context for evaluating climate change cognition.

1.4. The present study

In this study we examined agreement with encyclical messages as a function of the interplay between priors and papal credibility assessments to further unpack how audiences interpreted the messages of *Laudato si'* and evaluated the messenger, Pope Francis. There are a few reasons to expect that Pope Francis's message would increase climate concern among the public in the United States. First, public opinion polls have consistently found high favorability ratings for Pope Francis among both Catholics and non-Catholics (Pew Research Center, 2014b). Moreover, by relating

⁴ The Kyoto Protocol is an international treaty extending the 1992 United Nations Framework Convention on Climate Change that commits those involved to reducing greenhouse gas emissions. It was adopted in Japan on December 11, 1997.

climate change action to moral issues—such as care for the poor and vulnerable—the Pope contextualized climate change in the moral domain, where his office as the leader of the world’s second largest religion asserts great authority and credibility (Schuldt et al., 2017).

There are also reasons, however, to be skeptical of the breadth of *Laudato si’s* influence. Given that people evaluate information through the lens of their priors and group affiliations, politically liberal individuals (who traditionally already support climate change action) might have rejoiced that an otherwise conservative figure promoted progressive causes and thus likely accepted the messages that they were already predisposed to believe. However, conservatives might have been alienated by the Pope’s promotion of progressive causes, and in turn questioned his credibility and rejected the messages that are incompatible with their worldviews. This result would be unsurprising, but would confirm that credibility’s persuasive power is limited when motivated reasoning based on priors and group membership is strong.

This context also presents an opportunity to examine what happens when priors and group membership are in conflict. Upon hearing the encyclical’s appeals, it is possible that Catholics felt such conflict between their religion and their politics. We therefore examined agreement with encyclical messages as a function of 1) the interplay between political priors and papal credibility assessments, and 2) the interplay between Catholic-identity priors and papal credibility assessments.

2. Materials and method

2.1. Sample

The data used in this study come from the Pre/Post-Encyclical Panel of the 2015 Annenberg Public Policy Center Climate Change Study. Surveys were conducted with U.S. individuals via telephone by Abt SRBI, a global survey research firm. The original pre-encyclical ($N = 1381$) cross-sectional survey utilized an overlapping dual frame random digit dial (RDD) sample design to generate a probability-based, nationally-representative survey. Of the participants who agreed to be re-contacted, 602 completed second interviews immediately following the release of the papal encyclical (i.e., the Post-Encyclical Panel survey, administered between June 19 and July 2, 2015).⁵ This panel of 602 participants interviewed both before and after the encyclical was the sample used for the present study, although sample sizes varied in analyses according to missing data (listwise deletion was used in such cases). Raw data and codebook used in this study are available in the [supplementary materials](#)⁶

2.2. Socio-demographics

The sample was 77.9% white non-Hispanic, 6.3% black non-Hispanic, 2.3% other non-Hispanic, 10% Hispanic, 1.7% biracial, and 1.7% unreported; 50% female; ranged from 18 to 96 years old ($M = 57.7$, $SD = 17.35$); with an average education of 15 years in school ($SD = 3.06$). Political ideology was measured on a scale that ranged from very liberal to very conservative (1 = *very liberal*; 5 = *very conservative*; $M = 3.28$, $SD = 1.22$). Because Pope Francis’s influence on his own constituency was of particular interest, Catholics were oversampled ($n = 217$, 36% of the sample).

⁵ Of the final sample of 602, 319 completed the survey over landline and 283 completed the survey over cellphone.

⁶ In addition, SPSS versions of the data and syntax are available at <https://www.annenbergpublicpolicycenter.org/publication/pope-francis-and-climate-change-cognition-suppmat/>

2.3. Variables

2.3.1. Outcome variables

Our survey captured public agreement/disagreement with two of the arguments presented in Pope Francis’s encyclical: that climate change is a serious issue and that climate change disproportionately affects the poor. Perceptions of both of these arguments were measured before the release of the encyclical (at time 1) and after the release of the encyclical (time 2).

To capture views about the seriousness of climate change, participants were asked whether “addressing climate change” was a very serious issue confronting the nation (4), somewhat serious (3), not too serious (2), or not at all serious issue confronting the nation (1; time 1: $M = 3.35$, $SD = 0.99$; time 2: $M = 3.32$, $SD = 0.98$). There was no overall difference between people’s beliefs about the seriousness of climate change before (time 1) and after (time 2) the encyclical’s release, $t(586) = 0.84$, $p = 0.401$.

To capture views about whether climate change disproportionately affects the poor, participants were asked, “how accurate is it to say that climate change will have a greater effect on the poor than on those in better economic circumstances”: very accurate (4), somewhat accurate (3), not too accurate (2), not accurate at all (1), and don’t think climate change is happening (0; time 1: $M = 2.85$, $SD = 1.17$; time 2: $M = 2.99$, $SD = 1.06$). Unlike with the seriousness item, there was an overall difference such that people increased their agreement with the statement that climate change will have a greater effect on the poor after the release of the encyclical, $t(579) = 3.537$, $p < 0.001$.

2.3.2. Mediating and moderating variables

We anticipated that acceptance of the Pope’s messages would be dependent on (a) whether participants were aware of the papal encyclical, (b) how much credibility they assigned to Pope Francis with regard to climate change, and (c) their priors and group affiliations (i.e., political ideology and Catholic affiliation). Therefore, we also measured these variables.

To capture encyclical awareness, participants were asked at time 2 whether they had “heard or read anything about Pope Francis issuing an official church document known as an encyclical, on climate change and other issues”. Participants who said “yes” were scored as 1 ($n = 308$ of 602, 51.2%), everyone else received a 0.

Participants’ perceptions of the Pope’s credibility on several issues were also measured. Participants were asked how credible Pope Francis is when he speaks about the moral obligation to oppose abortion, the moral obligation to address climate change, and the moral obligation to help the poor (1 = *not at all credible*; 5 = *very credible*). These perceptions were captured both before and after the encyclical release. There was a significant increase between time 1 and time 2 regarding the Pope’s credibility when he talks about the moral obligation to act to address climate change, but not on the other two issues (see [Table 1](#)).⁷ Pope Francis’s credibility on climate change was used as the mediator in the main analysis.

3. Results

The primary focus of this study was to examine whether the release of the papal encyclical influenced people’s beliefs about climate change. Specifically, we aimed to determine whether awareness of the encyclical influenced beliefs about (a) the seriousness of climate change and (b) beliefs about climate change’s effect on the poor, and whether perceptions about the credibility of the pope on

⁷ See Appendix for examination of priors and group membership on credibility assessments.

Table 1
Pre- and post-encyclical papal credibility assessments.

Moral obligation to...	Pre-encyclical	Post-encyclical	Difference
Oppose abortion	3.43 (1.50)	3.49 (1.49)	0.08 (1.35) ^{ns}
Address climate change	3.04 (1.50)	3.27 (1.47)	0.18 (1.13) ^{***}
Help the poor	3.99 (1.29)	4.08 (1.22)	0.06 (1.07) ^{ns}

Note. Means are reported with standard deviations in parentheses.

^{***} $p < 0.001$

climate change mediated this relationship. We also predicted that political ideology and Catholicism would moderate the influence of awareness.⁸

3.1. Beliefs about the seriousness of climate change

To test the effect of awareness on beliefs about the seriousness of climate change, we ran two different models. First, we tested the direct effect of encyclical awareness on beliefs about the seriousness of climate change, moderated by political ideology, and the indirect effect, via perceptions about papal credibility on climate change, also moderated by ideology. The model used 5000 bootstrap samples with bias-corrected confidence intervals. The results show that encyclical awareness had no *direct* influence on beliefs about the seriousness of climate change ($b = 0.02$ (0.06), $p = 0.71$), nor was this relationship moderated by political ideology ($b = -0.02$ (0.06), $p = 0.76$). The model does show, however, that the *indirect* effect was significant ($b = -0.06$, 95% CI: -0.1122 to -0.0234 ; see Fig. 1). Being aware of the papal encyclical increased perceptions of papal credibility on climate change ($b = 0.19$ (0.08), $p < 0.05$), but this relationship was moderated by political ideology so that more conservative individuals, aware of the encyclical, were less likely to have increased perceptions of papal credibility ($b = -0.26$ (0.08), $p < 0.001$). Increased perceptions of papal credibility, then, predicted increases in beliefs about the seriousness of climate change ($b = 0.23$ (0.04), $p < 0.001$), controlling for pre-encyclical beliefs about the seriousness of climate change, among other variables (see Appendix, Table B1).

Next, we tested a similar model but looked at the moderating influence of Catholicism, rather than political ideology, also using 5000 bootstrap samples with bias-corrected confidence intervals. The results show that encyclical awareness had no direct influence on attitudes about the seriousness of climate change ($b = 0.05$ (0.08), $p = 0.49$), nor was this relationship moderated by Catholicism ($b = -0.08$ (0.12), $p = 0.51$). The model shows that the indirect effect was also not significant ($b = -0.05$, 95% CI: -0.1369 to 0.0079). Encyclical awareness increased perceptions of papal credibility on climate change ($b = 0.29$ (0.09), $p < 0.01$), and this relationship was not moderated by Catholicism ($b = -0.25$ (0.15), $p = 0.11$). Increased perceptions of papal credibility predicted increases in beliefs about the seriousness of climate change ($b = 0.22$ (0.04), $p < 0.001$), though the mediation model was not significant (see Appendix, Table B2). See Appendix B for full results of the regression analyses.⁹

⁸ Statistical analyses were conducted using PROCESS (Hayes, 2013, Model 8). PROCESS uses ordinary least squares regression to simultaneously estimate the direct and indirect effects of awareness of the encyclical on beliefs about the seriousness of climate change and beliefs about its effect on the poor.

⁹ Per reviewer suggestions, we also used hierarchical OLS regression to test for an initial direct effect of encyclical awareness on beliefs about the seriousness of climate change, prior to including either moderator, ideology or Catholicism, and the mediator papal credibility. Awareness had no direct effect on beliefs about the seriousness of climate change, $b = 0.04$, $t = 1.05$, $p = 0.29$, $\Delta R^2 = 0.001$. This finding further demonstrates that a significant initial direct effect is not a prerequisite for testing for mediation (Bollen, 1989; Hayes, 2009; Hayes, 2013).

3.2. Beliefs about climate change disproportionately affecting the poor

To test the effect of awareness on beliefs about the effect of climate change on the poor, we ran two models similar to the ones examining perceptions of seriousness; one examining the moderating influence of political ideology and the other examining the moderating influence of Catholicism. Again, the models used 5000 bootstrap samples with bias-corrected confidence intervals. The results show that encyclical awareness had no direct influence on beliefs about the effect of climate change on the poor ($b = -0.06$ (0.07), $p = 0.36$), nor was this relationship moderated by political ideology ($b = 0.06$ (0.07), $p = 0.31$). However, the model shows that the indirect effect was significant ($b = -0.05$, 95% CI: -0.0931 to -0.0177 ; see Fig. 2). Encyclical awareness increased perceptions of papal credibility on climate change ($b = 0.17$ (0.08), $p < 0.05$), but this relationship was moderated by political ideology so that more conservative individuals, aware of the encyclical, were less likely to have increased perceptions of papal credibility ($b = -0.30$ (0.08), $p < 0.001$). Increased perceptions of papal credibility, then, predicted increases in beliefs about the effect of climate change on the poor ($b = 0.15$ (0.04), $p < 0.001$), controlling for pre-encyclical beliefs about the effect of climate change on the poor among other variables (see Appendix, Table C1).

When examining the moderating influence of Catholicism, rather than political ideology, the results show that encyclical awareness had no direct influence on beliefs about the effect of climate change on the poor ($b = -0.14$ (0.08), $p = 0.09$), and this was not moderated by Catholicism ($b = 0.22$ (0.14), $p = 0.11$). However, the model shows that the indirect effect was significant ($b = -0.05$, 95% CI: -0.1264 to -0.0059 ; see Fig. 3). Encyclical awareness increased perceptions of papal credibility on climate change ($b = 0.29$ (0.10), $p < 0.01$), and this relationship was moderated such that *non-Catholics* who were aware of the encyclical granted Pope Francis more credibility on climate change than *non-Catholics* who were unaware of the encyclical, whereas there were no differences between Catholics regardless of encyclical awareness ($b = -0.33$ (0.16), $p < 0.05$).¹⁰ Increased perceptions of papal credibility predicted increases in beliefs about the effect of climate change on the poor ($b = 0.15$ (0.04), $p < 0.001$, see Appendix, Table C2). See Appendix C for full results of the regression analyses.¹¹

4. Discussion

This study illuminates the interplay of message awareness, prior values, and credibility assessments in the real-world context of a noteworthy event – the release of Pope Francis's encyclical *Laudato si'*. The results demonstrate that encyclical messages were processed through the perceptual filter of political ideology, and that processing informed assessments of Pope Francis's credibility on climate change. The results also demonstrate that, when compared to *non-Catholics* who were unaware of the encyclical, *non-Catholics* who were aware of the encyclical granted Pope Francis additional credibility. In turn, credibility assessments influenced agreement with encyclical messages about climate change severity and the effect of climate change on the poor.

¹⁰ Regardless of encyclical awareness, Catholics afforded the pope high credibility, see Appendix D.

¹¹ Per reviewer suggestions, we also used hierarchical OLS regression to test for an initial direct effect of encyclical awareness on beliefs about the effect of climate change on the poor, prior to including either moderator, ideology or Catholicism, and the mediator papal credibility. Awareness had no direct effect on beliefs about the effect of climate change on the poor, $b = -0.02$, $t = -0.43$, $p = 0.67$, $\Delta R^2 = 0$. This finding further demonstrates that a significant initial direct effect is not a prerequisite for testing for mediation (Bollen, 1989; Hayes, 2009; Hayes, 2013).

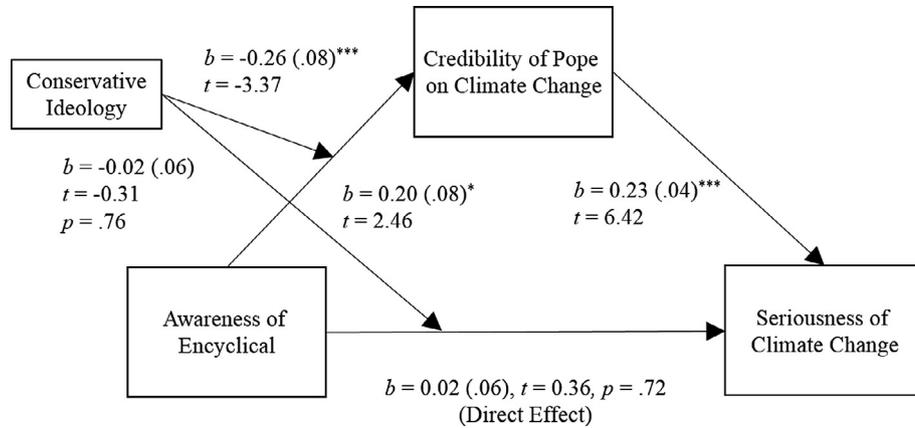


Fig. 1. Indirect effect of encyclical awareness on beliefs about the seriousness of climate change, with political ideology moderating the influence of awareness. Indirect effect via perceived credibility of the pope on climate change = -0.06 (0.02) (95% CI: -0.1122 to -0.0234). All coefficients are standardized and p -values are two-tailed. Control variables include gender, age, race, education, religious attendance, Catholicism, and pre-encyclical belief about the seriousness of climate change. $N = 514$.

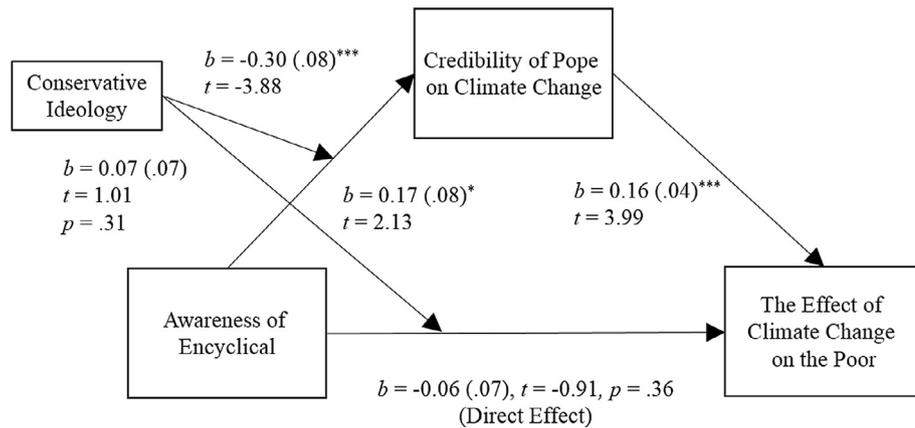


Fig. 2. Indirect effect of encyclical awareness on beliefs about the effect of climate change on the poor, with political ideology moderating the influence of awareness. Indirect effect via perceived credibility of the pope on climate change = -0.05 (0.02) (95% CI: -0.0931 to -0.0177). All coefficients are standardized and p -values are two-tailed. Control variables include gender, age, race, education, religious attendance, ideology, and pre-encyclical belief about the effect of climate change on the poor. $N = 508$.

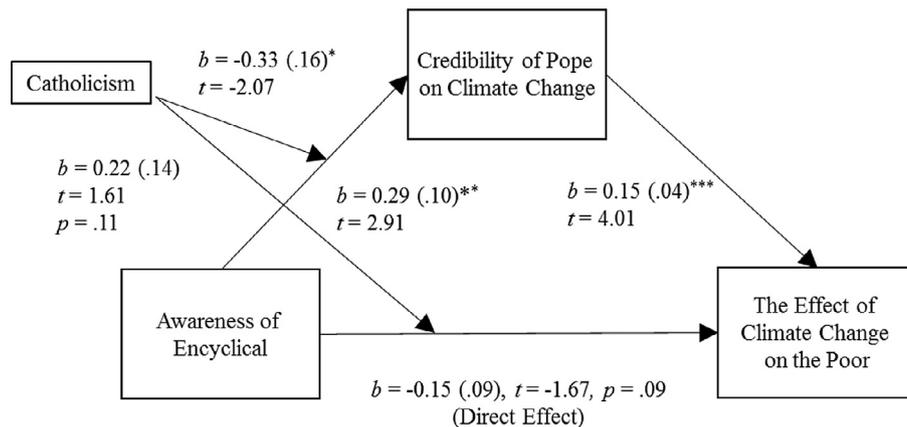


Fig. 3. Indirect effect of encyclical awareness on beliefs about the effect of climate change on the poor, with Catholicism moderating the influence of awareness. Indirect effect via perceived credibility of the pope on climate change = -0.05 (0.03) (95% CI: -0.1264 to -0.0059). All coefficients are standardized and p -values are two-tailed. Control variables include gender, age, race, education, religious attendance, ideology, and pre-encyclical belief about the effect of climate change on the poor. $N = 508$. See Appendix, Fig. D1. Standardized version of dependent variable is shown. Encyclical awareness increased perceptions of papal credibility on climate change ($b = 0.29$ (0.10), $p < 0.01$), and this relationship was moderated such that *non*-Catholics who were aware of the encyclical granted Pope Francis more credibility on climate change than *non*-Catholics who were unaware of the encyclical, whereas there were no significant differences between Catholics regardless of encyclical awareness ($b = -0.33$ (0.16), $p < 0.05$).

4.1. Limitations

This study had a few limitations. Asking participants about Pope Francis and the encyclical before its release—and contacting them afterward—may have led participants to think they had heard about the encyclical, which could mean that some participants actually knew very little about the Pope's message. Moreover, even though almost half of the sample indicated they were unaware of the encyclical after its release, it is possible that they still were indirectly exposed to its messages via heightened climate change discourse in mass media, social media, or interpersonal communication. Thus, even though encyclical awareness was an important component of our model, a more nuanced measure of exposure to encyclical messages could be more informative than the dichotomous measure the survey employed. However, this limitation is somewhat offset by the nature of the study sample. Given that we were especially concerned with both pre- and post-encyclical measurement, it would not have been possible to examine the nuances of encyclical messaging during pre-encyclical data collection before such messages were disseminated.

Likewise, it can also be argued that more nuanced measurement of other components of our model would have been useful. For example, there are more robust and commonly used measures of credibility (e.g., McCroskey & Teven, 1999). While examining this topic using multi-dimensional measurements of Pope Francis's credibility could be very informative, we had several reasons for using this particular set of measures. First, we were not as interested in Pope Francis's general trustworthiness, goodwill, or competence as we were in his specific credibility on moral issues. Therefore, we accepted the tradeoff of using novel measurements specifically tailored to the context we were interested in rather than more established and validated measurements lacking such contextual specificity. Likewise, we also had to balance the demands of conducting a multi-purpose public opinion survey and measuring several concepts with sufficient rigor. Given the need to measure several concepts (e.g., climate change attitudes, credibility, etc.) while avoiding questionnaire fatigue, we felt that our measurement approach was a suitable approach to the research questions at hand.

4.2. Implications

4.2.1. Advancing climate change cognition

Volumes of both popular journalism and academic research have been written about *Laudato si'*, often searching for a “Francis Effect” characterized by more progressive climate change attitudes among conservatives after exposure to the encyclical (see Maibach et al., 2015; Wallis, 2015). Whether such an effect occurred may rest mainly on the metric used. Most attitudes (e.g., “global warming is caused by human activity”) still largely adhere to political party lines after the encyclical (see Li et al., 2016). However, perceiving climate change as a moral issue seems to be one particular effect demonstrated across several encyclical studies (see Maibach et al., 2015; Schuldt et al., 2017).

Perceiving that climate change will have a greater effect on the poor is one component of perceiving climate change as a moral issue (Landrum, Lull, Akin, & Jamieson, 2016). This study demonstrates some small evidence of a “Francis effect” in this domain. In particular, among non-Catholics, being aware of the encyclical increased Pope Francis's credibility about the moral

obligation to address climate change, which in turn increased perceptions that climate change will have a greater effect on the poor (see Fig. 3). While this effect is quite small ($\Delta R^2 = 0.01$), it does support the notion that the encyclical might have had some influence in the context of perceiving climate change as a moral issue.

As the research literature addressing *Laudato si'* expands rapidly, it is useful to highlight the independent contribution of the present study. Perhaps most importantly, this study tests the influence of *Laudato si'* not just in terms of a “Francis Effect,” but also as an event that allows for a unique natural experimental examination of climate change cognition. In doing so, it partially unpacks the “black box” of processing and evaluating the encyclical messages – a “black box” that is alluded to but not examined in previous studies addressing credibility, ideology, and moral framing (e.g., Li et al., 2016; Schuldt et al., 2017). These results suggest that encyclical messages are processed and evaluated according to the interplay between message awareness, prior values, and credibility assessments. Crucially, credibility assessments serve as the fulcrum of this model; it is through perceptions of Pope Francis's credibility—which are either bolstered by liberal ideology, undermined by conservative ideology, or, in the case of non-Catholics' perceptions of climate change's effect on the poor, bolstered by encyclical awareness—that the encyclical messages are either accepted or rejected.

We also draw particular attention to our study design. Collecting pre- and post-encyclical data from a panel of survey respondents affords the ability to partly isolate encyclical effects. Although this design does not offer the same amount of control as a true laboratory within-subjects experiment, we were able to partly isolate encyclical effects by using pre- and post-encyclical measures as well as encyclical awareness. Such a design enables us to control for previous attitudes, determine whether a respondent was familiar with the encyclical, and if so, attribute some degree of post-encyclical attitude change to the encyclical itself. Cross-sectional surveys, even if collected both before and after the encyclical (e.g., Li et al., 2016; Maibach et al., 2015) cannot make such attributions.

4.2.2. Messaging implications

Instances in which social issues are controversial and polarizing – such as debates about climate change – raise important questions about the feasibility of overcoming ideological rifts. When scientific consensus exists but debate persists, it is useful to inquire whether particular messaging strategies, including appeals by new types of authorities, reduce disagreement. As demonstrated by the present study, when authorities attempt to leverage their credibility to influence public opinion about a heavily politicized issue, they face a daunting task. Beliefs are highly resistant to change; attempts to change them will only succeed in certain circumstances and are highly influenced by the interplay between priors and credibility assessments.

4.3. Conclusion

It is not surprising that the encyclical's messages were processed through the perceptual filter of political ideology. Priors are resilient and do not transform easily, even when challenged by a trustworthy authority. However, the importance of source credibility in this process is noteworthy. The results indicated consistent conditional indirect effects: among more liberal

Table A1
Results of mixed-design ANOVA.

Within-subjects effects	df	MS	F	p	η_p^2
Domain	2	178.16	113.24	<0.001	0.180
Domain * Catholic	2	1.51	0.96	0.384	0.002
Domain * Ideology	4	65.22	41.46	<0.001	0.139
Domain * Catholic * Ideology	4	0.49	0.31	0.869	0.001
Error (domain)	1030	1.57			
Time	1	5.46	5.41	0.020	0.010
Time * Catholic	1	0.57	0.56	0.453	0.001
Time * Ideology	2	1.48	1.47	0.231	0.006
Time * Catholic * Ideology	2	1.12	1.11	0.330	0.004
Error (Time)	515	1.01			
Domain * Time	2	0.82	1.52	0.218	0.003
Domain * Time * Catholic	2	0.75	1.39	0.249	0.003
Domain * Time * Ideology	4	1.31	2.44	0.045	0.009
Domain * Time * Cath * Ideo	4	0.44	0.81	0.519	0.003
Error (Domain * Time)	1030	0.54			
Between-subjects effects					
Catholic	1	366.27	70.11	<0.001	0.120
Ideology	2	4.75	0.91	0.403	0.002
Catholic * Ideology	2	1.94	0.37	0.690	0.001
Error	515	5.22			

respondents, message awareness facilitated acceptance of encyclical messages through greater credibility assessments, and among more conservative respondents, message awareness facilitated rejection of encyclical messages through lower credibility assessments. Crucially, the absence of conditional direct effects – which would have demonstrated that, even after accounting for messenger credibility assessments, message awareness facilitated acceptance or rejection of encyclical messages depending on political ideology – suggests that, in this context, the messenger played an outsized role compared to the message.

Opening up the “black box” of climate change cognition in the context of *Laudato si'*, it appears that Deacon Ditlew – echoing Marshall McLuhan almost 50 years prior – was correct. When it comes to Pope Francis and *Laudato si'*, “the medium is the message” (McLuhan, 1964). Driven by political ideology, assessments of the credibility of Pope Francis (the messenger/medium) were what urged acceptance of the messages in *Laudato si'*.

Appendix A

A1. Examining the influence of priors and group membership on credibility assessments

Also of interest, but not the primary focus of the study, was whether Pope Francis was attributed less credibility in the area of climate change than in the other two areas, which are more commonly associated with Catholicism, and whether this varies based on the political ideology and Catholic affiliation status of participants. To examine this, we conducted a mixed-design ANOVA with domain (abortion, climate change, poor) and time (pre-encyclical, post-encyclical) as within-participants variables and ideology (liberal, moderate, conservative)¹² and Catholic

affiliation (Catholic, non-Catholics) as between-participants variables.

Somewhat consistent with our hypotheses, we found a main effect of domain, $F(2, 1030) = 113.24$, $p < 0.001$, $\eta_p^2 = 0.180$. Although we had anticipated that participants would attribute less credibility to the Pope regarding climate change than abortion and the poor, Bonferroni-corrected pairwise comparisons show no significant differences between attributions of credibility regarding abortion and climate change ($p = 0.183$), but they did reveal that more credibility attributed to the Pope when speaking about the poor than when speaking about abortion or climate change (both $ps < 0.001$). Although this effect did not vary based on Catholicism (no domain by Catholic interaction), it did vary by political ideology (domain by ideology interaction). Follow-up analyses show that liberals ($n = 136$) rate Pope Francis's credibility on climate change ($M = 3.68$) higher than his credibility on abortion ($M = 2.85$, $p < 0.001$), but lower than his credibility regarding the poor ($M = 4.24$, $p < 0.001$). Conservatives ($n = 248$), on the other hand, rate the Pope's credibility on climate change ($M = 2.83$) lower than both his credibility on abortion ($M = 3.75$, $p < 0.001$) and on the poor ($M = 3.91$, $p < 0.001$). Moderates ($n = 137$) reflect the pattern of the overall effect, rating the Pope's credibility on climate change ($M = 3.51$) not significantly different than his credibility on abortion ($M = 3.27$, $p = 0.105$), but lower than his credibility on the poor ($M = 4.11$, $p < 0.001$). Also noteworthy, but perhaps unsurprisingly, Catholics ($n = 197$) rate Pope Francis as more credible (collapsed across domain, $M = 4.03$) than non-Catholics ($n = 324$; $M = 3.30$, $p < 0.001$) (see Table A1).

Appendix B

B1. Beliefs about the seriousness of climate change

See Table B2.

¹² For this analysis, the ideology variable was recoded so that very liberal (1) and liberal (2) were combined and scored as -1, moderates were scored as 0, and very conservative and conservative were combined and scored as 1.

Table B1

The direct and indirect effects of awareness of papal encyclical on beliefs about the seriousness of climate change, with conservative ideology as a moderator.

	Perceived credibility of pope on climate change (T ₂)		Seriousness of climate change (T ₂)	
	B	(SE)	B	(SE)
Constant	-0.216	(0.062) ^{***}	-0.029	(0.050)
Gender (T ₁)	-0.031	(0.037)	0.015	(0.030)
Age (T ₁)	0.163	(0.039) ^{***}	-0.023	(0.032)
White (T ₁)	-0.010	(0.055)	-0.035	(0.044)
Black (T ₁)	-0.021	(0.051)	0.025	(0.040)
Hispanic (T ₁)	0.062	(0.043)	-0.026	(0.034)
Education (T ₁)	-0.044	(0.040)	0.017	(0.032)
Religious Attendance (T ₁)	0.081	(0.093)	-0.017	(0.032)
Seriousness of Climate Change (T ₁)	0.429	(0.043) ^{***}	0.501	(0.037) ^{***}
Catholicism (T ₁)	0.308	(0.078) ^{***}	0.059	(0.064) ^{**}
Conservative Ideology (T ₁)	0.041	(0.062)	-0.137	(0.044) ^{**}
Awareness of Encyclical (T ₂)	0.195	(0.079) [*]	0.023	(0.036)
Awareness x Ideology	-0.259	(0.080) ^{***}	-0.019	(0.062) ^{***}
Credibility of Pope (T ₂)			0.229	(0.036) ^{***}
	$R^2 = 0.32$		$R^2 = 0.56$	

T₁ = Time 1 – Pre encyclical; T₂ = Time 2 – Post-encyclical.

N = 514.

* p < 0.05.

** p < 0.01.

*** p < 0.001.

Table B2

The direct and indirect effects of awareness of papal encyclical on beliefs about the seriousness of climate change, with Catholicism as a moderator.

	Perceived credibility of pope on climate change (T ₂)		Seriousness of climate change (T ₂)	
	B	(SE)	B	(SE)
Constant	-0.258	(0.069) ^{***}	-0.043	(0.055)
Gender (T ₁)	-0.035	(0.038)	0.014	(0.030)
Age (T ₁)	0.161	(0.039) ^{***}	-0.029	(0.032)
White (T ₁)	0.022	(0.055)	-0.036	(0.044)
Black (T ₁)	-0.023	(0.051)	0.027	(0.040)
Hispanic (T ₁)	0.058	(0.043)	-0.026	(0.034)
Education (T ₁)	-0.046	(0.040)	0.017	(0.032)
Religious Attendance (T ₁)	0.095	(0.040) [*]	-0.015	(0.032)
Seriousness of Climate Change (W ₁)	0.456	(0.043) ^{***}	0.509	(0.038) ^{***}
Catholicism (T ₁)	0.455	(0.121) ^{***}	0.106	(0.097) [*]
Conservative Ideology (T ₁)	-0.109	(0.043) [*]	-0.156	(0.035) ^{***}
Awareness of Encyclical (T ₂)	0.292	(0.099) ^{**}	0.054	(0.079)
Awareness x Catholicism	-0.254	(0.156)	-0.081	(0.124)
Credibility of Pope (T ₂)			0.229	(0.035) ^{***}
	$R^2 = 0.30$		$R^2 = 0.56$	

T₁ = Time 1 – Pre encyclical; T₂ = Time 2 – Post-encyclical.

N = 514.

* p < 0.05.

** p < 0.01.

*** p < 0.001.

Appendix C

C1. Beliefs about climate change disproportionately affecting the poor

See [Table C2](#).

Table C1

The direct and indirect effects of awareness of papal encyclical on beliefs about the effects of climate change on the poor, with conservative ideology as a moderator.

	Perceived credibility of pope on climate change (T ₂)		Effects of climate change on the poor (T ₂)	
	B	(SE)	B	(SE)
Constant	-0.212	(0.063) ^{***}	0.060	(0.055)
Gender (T ₁)	-0.042	(0.038)	-0.014	(0.033)
Age (T ₁)	0.151	(0.040) ^{***}	-0.010	(0.035)
White (W ₁)	-0.009	(0.056)	0.034	(0.049)
Black (T ₁)	-0.003	(0.051)	0.047	(0.044)
Hispanic (T ₁)	0.055	(0.044)	-0.043	(0.038)
Education (T ₁)	-0.041	(0.040)	-0.070	(0.035)
Religious Attendance (T ₁)	0.057	(0.040)	-0.030	(0.035) ^f
Climate Change on the Poor (T ₁)	0.350	(0.040) ^{***}	0.536	(0.038) ^{***}
Catholicism (T ₁)	0.341	(0.080) ^{***}	-0.070	(0.071)
Conservative Ideology (T ₁)	-0.018	(0.063)	-0.206	(0.053) ^{***}
Awareness of Encyclical (T ₂)	0.172	(0.081) [*]	-0.064	(0.070)
Awareness x Ideology	-0.301	(0.078) ^{***}	0.069	(0.069)
Credibility of Pope (T ₂)			0.156	(0.039) ^{***}
	R ² = 0.29		R ² = 0.47	

T₁ = Time 1 – Pre encyclical; T₂ = Time 2 – Post-encyclical.

N = 508.

^f p < 0.10.^{*} p < 0.05.^{**} p < 0.01.^{***} p < 0.001.**Table C2**

The direct and indirect effects of awareness of papal encyclical on beliefs about the effects of climate change on the poor, with Catholicism as a moderator.

	Perceived credibility of pope on climate change (T ₂)		Effects of climate change on the poor (T ₂)	
	B	(SE)	B	(SE)
Constant	-0.262	(0.070) ^{***}	0.098	(0.061)
Gender (T ₁)	-0.045	(0.039)	-0.012	(0.033)
Age (T ₁)	0.150	(0.040) ^{***}	0.009	(0.035)
White (T ₁)	-0.023	(0.056)	0.038	(0.048)
Black (T ₁)	-0.004	(0.052)	0.045	(0.044)
Hispanic (T ₁)	0.050	(0.044)	-0.042	(0.038)
Education (T ₁)	-0.042	(0.040)	-0.069	(0.035) ^f
Religious Attendance (T ₁)	0.072	(0.041) ^f	-0.035	(0.035)
Climate Change on the Poor (T ₁)	0.377	(0.041) ^{***}	0.527	(0.038) ^{***}
Catholicism (T ₁)	0.531	(0.123) ^{***}	-0.197	(0.108) ^f
Conservative Ideology (T ₁)	-0.195	(0.041) ^{***}	-0.166	(0.036) ^{***}
Awareness of Encyclical (T ₂)	0.295	(0.102) ^{**}	-0.147	(0.088) ^f
Awareness x Catholicism	-0.333	(0.161) [*]	0.222	(0.138) ^{***}
Credibility of Pope (T ₂)			0.155	(0.039) ^{***}
	R ² = 0.27		R ² = 0.47	

T₁ = Time 1 – Pre encyclical; T₂ = Time 2 – Post-encyclical.

N = 508.

^f p < 0.10.^{*} p < 0.05.^{**} p < 0.01.^{***} p < 0.001.**Appendix D**

See Fig. D1.

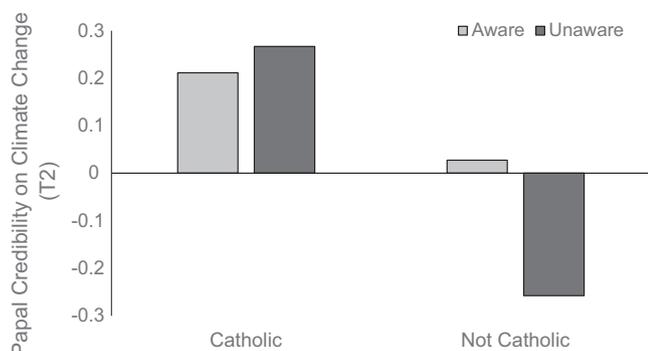


Fig. D1. Standardized version of dependent variable is shown. Encyclical awareness increased perceptions of papal credibility on climate change ($b = 0.29$ (0.10), $p < 0.01$), and this relationship was moderated such that *non*-Catholics who were aware of the encyclical granted Pope Francis more credibility on climate change than *non*-Catholics who were unaware of the encyclical, whereas there were no significant differences between Catholics regardless of encyclical awareness ($b = -0.33$ (0.16), $p < 0.05$).

Appendix E. Supplementary material

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.cognition.2017.05.015>.

References

- Anderegg, W. R. L., Prall, J. W., Harold, J., & Schneider, S. H. (2010). Expert credibility in climate change. *Proceedings of the National Academies of Sciences*, 107(27), 12107–12109. <http://dx.doi.org/10.1073/pnas.1003187107>.
- Annenberg Public Policy Center. Data set for Pope Francis and Climate Change Cognition Study. Available as part of the Supplementary Materials and at <https://www.annenbergpublicpolicycenter.org/publication/pope-francis-and-climate-change-cognition-suppmat/>.
- Asay, P., 2016, March 21. A-list celebrities line up to meet the Pope. *Aleteia*. Retrieved from <http://forher.aleteia.org/articles/celebrities-met-pope/>.
- Barker, D. C., & Bearce, D. H. (2013). End-times theology, the shadow of the future, and public resistance to addressing global climate change. *Political Research Quarterly*, 66(2), 267–279. <http://dx.doi.org/10.1177/1065912912442243>.
- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117(3), 497–529. <http://dx.doi.org/10.1037/0033-2909.117.3.497>.
- Bettencourt, B. A., & Hume, D. (1999). The cognitive contents of social-group identity: Values, emotions, and relationships. *European Journal of Social Psychology*, 29(1), 113–121. [http://dx.doi.org/10.1002/\(SICI\)1099-0992\(199902\)29:1<113::AID-EJSP911>3.0.CO;2-G](http://dx.doi.org/10.1002/(SICI)1099-0992(199902)29:1<113::AID-EJSP911>3.0.CO;2-G).
- Bollen, K. A. (1989). *Structural equations with latent variables*. New York, NY: John Wiley and Sons.
- Brossard, D., Scheufele, D. A., Kim, E., & Lewenstein, B. V. (2009). Religiosity as a perceptual filter: Examining processes of opinion formation about nanotechnology. *Public Understanding of Science*, 18(5), 546–558. <http://dx.doi.org/10.1177/0963662507087304>.
- Catholic Church, 2001. Global climate change: A plea for dialogue, prudence, and the common good. United States Conference of Catholic Bishops. Retrieved from <http://www.usccb.org/issues-and-action/human-life-and-dignity/environment/global-climate-change-a-plea-for-dialogue-prudence-and-the-common-good.cfm>.
- Caulfield, T., & Fahy, D. (2016). Perspective: Science, celebrities, and public engagement. *Issues in Science and Technology*, 32(4), 24–26.
- Chua-Eoan, H., & Dias, E. (2013). Pope Francis, the people's pope. *Time Magazine*. December 11, Retrieved from <http://poy.time.com/2013/12/11/person-of-the-year-pope-francis-the-peoples-pope/>.
- Clark, R. D., & Maass, A. (1988). The role of social categorization and perceived source credibility in minority influence. *European Journal of Social Psychology*, 18(5), 381–394. <http://dx.doi.org/10.1002/ejsp.2420180502>.
- Cohen, G. L. (2003). Party over policy: The dominating impact of group influence on political beliefs. *Journal of Personality and Social Psychology*, 85(5), 808–822. <http://dx.doi.org/10.1037/0022-3514.85.5.808>.
- Ditewig, W.T., 2013, March 28. From the management. [Web log post]. Retrieved from <http://pilgrimsfootsteps.blogspot.com/2013/03/from-management.html>.
- Dunlap, R. E., & McCright, A. M. (2008). A widening gap: Republican and Democratic views on climate change. *Environment: Science and Policy for Sustainable Development*, 50(5), 26–35. <http://dx.doi.org/10.3200/ENVT.50.5.26-35>.
- Fiske, S. T., & Dupree, C. (2014). Gaining trust as well as respect in communicating to motivated audiences about science topics. *Proceedings of the National Academies of Sciences*, 111(4), 13593–13597. <http://dx.doi.org/10.1073/pnas.1317505111>.
- Francis (2015). *Laudato si' on care for our common home*. Vatican City, Italy: Encyclical Letter, Libreria Editrice Vaticana.
- Funk, C., & Kennedy, B. (2016). *The politics of climate*. Pew Research Center. Retrieved from <http://www.pewinternet.org/2016/10/04/the-politics-of-climate/>.
- Global Catholic Climate Movement (2017). Consistently living a pro-life ethic: Climate change, a pro-life issue Retrieved from <http://catholicclimatemovement.global/climate-change-a-pro-life-issue/>.
- Goodstein, L., & Gillis, J. (2015). *On planet in distress, a papal call to action*. New York Times. June 18, Retrieved from https://www.nytimes.com/interactive/2015/06/18/world/europe/encyclical-laudato-si.html?_r=0.
- Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs*, 76, 408–420. <http://dx.doi.org/10.1080/03637750903310360>.
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis*. New York, NY: The Guilford Press.
- Hendriks, F., Kienhues, D., & Bromme, R. (2016). Trust in science and the science of trust. In *Trust and communication in a digitized world* (pp. 143–159). Springer International Publishing.
- Ho, S. S., Brossard, D., & Scheufele, D. A. (2008). Effects of value predispositions, mass media use, and knowledge on public attitudes toward embryonic stem cell research.
- Hoffman, S. J., & Tan, C. (2013). Following celebrities medical advice: Meta-narrative analysis. *BMJ*, 347, f7151. <http://dx.doi.org/10.1136/bmj.f7151>.
- Jackson, R. L., & Hogg, M. A. (2010). Perceptual filtering. In *Encyclopedia of identity*, pp. 538). Thousand Oaks, CA: Sage Publications Ltd. <http://dx.doi.org/10.4135/9781412979306.n173>.
- Kahan, D. M., Braman, D., Cohen, G. L., Gastil, J., & Slovic, P. (2010). Who fears the HPV vaccine, who doesn't, and why? An experimental study of the mechanisms of cultural cognition. *Law and Human Behavior*, 34(6), 501–516. <http://dx.doi.org/10.1007/s10979-009-9201-0>.
- Kahan, D. M., Braman, D., Gastil, J., Slovic, P., & Mertz, C. K. (2007). Culture and identity-protective cognition: Explaining the white-male effect in risk perception. *Journal of Empirical Legal Studies*, 4(3), 465–505. <http://dx.doi.org/10.1111/j.1740-1461.2007.00097.x>.
- Kahan, D. M., Braman, D., Slovic, P., Gastil, J., & Cohen, G. (2009). Cultural cognition of the risks and benefits of nanotechnology. *Nature Nanotechnology*, 4, 87–90. <http://dx.doi.org/10.1038/nnano.2008.341>.
- Kahan, D. M., Peters, E., Wittlin, M., Slovic, P., Ouellette, L. L., Braman, D., & Mandel, G. (2012). The polarizing impact of science literacy and numeracy on perceived climate change risks. *Nature Climate Change*, 2, 732–735. <http://dx.doi.org/10.1038/nclimate1547>.
- Koenig, M. A., & Harris, P. L. (2005). The role of social cognition in early trust. *Trends in Cognitive Sciences*, 9(10), 457–459. <http://dx.doi.org/10.1016/j.tics.2005.08.006>.
- Kunda, Z. (1990). The case for motivated reasoning. *Psychological Bulletin*, 108(3), 480–498. <http://dx.doi.org/10.1037/0033-2909.108.3.480>.
- Landrum, A. R., Eaves, B. S., Jr., & Shafto, P. (2015). Learning to trust and trusting to learn: A theoretical framework. *Trends in Cognitive Sciences*, 19(3), 109–111. <http://dx.doi.org/10.1016/j.tics.2014.12.007>.
- Landrum, A. R., Lull, R. B., Akin, H. E., & Jamieson, K. H. (2016). Making it about morals: Pope Francis shifts the climate change debate. Paper presented at the 71st annual conference of the American Association for Public Opinion Research, Austin, TX, USA.
- Landrum, A. R., Mills, C. M., & Johnston, A. M. (2013). When do children trust the expert? Benevolence information influences children's trust more than expertise. *Developmental Science*, 16(4), 622–638. <http://dx.doi.org/10.1111/desc.12059>.
- Lewandowsky, S., Gignac, G. E., & Oberauer, K. (2013). The role of conspiracist ideation and worldviews in predicting rejection of science. *PLoS ONE*, 10(8), e75637. <http://dx.doi.org/10.1371/journal.pone.0075637>.
- Li, N., Hilgard, J., Scheufele, D. A., Winnef, K. M., & Jamieson, K. H. (2016). Crosspressing conservative Catholics? Effects of Pope Francis' encyclical on the U.S. public opinion on climate change. *Climatic Change*, 139, 367–380. <http://dx.doi.org/10.1007/s10584-016-1821-z>.
- Liang, X., Ho, S. S., Brossard, D., Xenos, M. A., Scheufele, D. A., & Anderson, A. A. (2015). Value predispositions as perceptual filters: Comparing of public attitudes toward nanotechnology in the United States and Singapore. *Public Understanding of Science*, 24(5), 582–600. <http://dx.doi.org/10.1177/0963662513510858>.
- Lord, C. G., Ross, L., & Lepper, M. R. (1979). Biased assimilation and attitude polarization: The effects of prior theories on subsequently considered evidence. *Journal of Personality and Social Psychology*, 37(11), 2098–2109. <http://dx.doi.org/10.1037/0022-3514.37.11.2098>.
- Lupia, A. (2016). *Uninformed: Why people seem to know so little about politics and what we can do about it*. New York, NY: Oxford University Press.
- Mackie, D. M., Gastardo-Conaco, M. C., & Skelly, J. J. (1992). Knowledge of the advocated position and the processing of in-group and out-group persuasive messages. *Personality and Social Psychology Bulletin*, 18(2), 145–151. <http://dx.doi.org/10.1177/0146167292182005>.
- Maibach, E., Leiserowitz, A., Roser-Renouf, C., Myers, T., Rosenthal, S., & Feinberg, G. (2015). *The Francis effect: How Pope Francis changed the conversation about global*

- warming. George Mason University and Yale University. Fairfax, VA: George Mason University Center for Climate Change Communication.
- McCright, A. M., & Dunlap, R. E. (2011). The politicization of climate change and polarization in the American public's views of global warming. *The Sociological Quarterly*, 52(2), 155–194.
- McCroskey, J. C., & Teven, J. J. (1999). Goodwill: A reexamination of the construct and its measurement. *Communication Monographs*, 66, 90–103.
- McLuhan, M. (1964). *Understanding media: The extensions of man*. Cambridge, MA: The MIT Press.
- National Association of Evangelicals (2015). Caring for God's Creation: A call to action Retrieved from <http://nae.net/caring-for-gods-creation/>.
- Nickerson, R. S. (1998). Confirmation bias: A ubiquitous phenomenon in many guises. *Review of General Psychology*, 2(2), 175–220. <http://dx.doi.org/10.1037/1089-2680.2.2.175>.
- Pew Research Center (2014a). Pope Francis' image positive in much of world Retrieved from <http://www.pewglobal.org/2014/12/11/pope-francis-image-positive-in-much-of-world/>.
- Pew Research Center (2014b). *U.S. Catholics view Pope Francis as change for the better*. Retrieved from <<http://www.pewforum.org/files/2014/03/Pope-Francis-change-for-the-better-full-report.pdf>>.
- Republican Platform 2016. Retrieved from <[https://prod-cdn-static.gop.com/media/documents/DRAFT_12_FINAL\[1\]-ben_1468872234.pdf](https://prod-cdn-static.gop.com/media/documents/DRAFT_12_FINAL[1]-ben_1468872234.pdf)>.
- Schuldt, J. P., Pearson, A. R., Romero-Canyas, R., & Larson-Konar, D. (2017). Brief exposure to Pope Francis heightens moral beliefs about climate change. *Climatic Change*, 141(2), 167–177. <http://dx.doi.org/10.1007/s10584-016-1893-9>.
- Shafto, P., Eaves, B., Navarro, D. J., & Perfors, A. (2012). Epistemic trust: modeling children's reasoning about others' knowledge and intent. *Developmental Science*, 15(3), 436–447. <http://dx.doi.org/10.1111/j.1467-7687.2012.01135.x>.
- Tajfel, H., Billig, M. G., Bundy, R. P., & Flament, C. (1971). Social categorization and intergroup behavior. *European Journal of Social Psychology*, 1(2), 149–178. <http://dx.doi.org/10.1002/ejsp.2420010202>.
- Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. *The Social Psychology of Intergroup Relations*, 33(47), 74.
- Turner, J. C., & Oakes, P. J. (1989). Self-categorization theory and social influence. In P. B. Paulus (Ed.), *Psychology of group influence* (2nd ed., pp. 233–275). Hillsdale, NJ, US: Laurence Erlbaum Associates Inc.
- United Church of Christ (2015). Climate change and global warming Retrieved from http://www.ucc.org/environmental-ministries_climate-change-and-global.
- Wallis, J. (2015, June 12). Will the papal encyclical bring the 'Francis Effect' to the climate debates? *Huffington Post*. Retrieved from <http://www.huffingtonpost.com/jim-wallis/will-the-papal-encyclical_b_7570164.html>.
- White, T. B. (2005). Consumer trust and advice acceptance: The moderating roles of benevolence, expertise, and negative emotions. *Journal of Consumer Psychology*, 15(2), 141–148. http://dx.doi.org/10.1207/s15327663jcp1502_6.
- Wilholt, T. (2013). Epistemic trust in science. *The British Journal for the Philosophy of Science*, 64(2), 233–253. <http://dx.doi.org/10.1093/bjps/axs007>.
- Zaleha, B. D., & Szasz, A. (2015). Why conservative Christians don't believe in climate change. *Bulletin of the Atomic Scientists*, 71, 19–30. <http://dx.doi.org/10.1177/00963402>.