

# Religious Stewardship and Pro-Environmental Action: The Mediating Roles of Environmental Guilt and Anger

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Past research has found that stewardship belief can motivate pro-environmentalism among religious individuals. The present study investigates the emotional pathways linking religious stewardship belief and pro-environmental policy support. In an online experiment conducted with Christians in the United States ( $N = 604$ ), we experimentally primed stewardship belief ( $N = 195$ ) using a video that highlighted the human responsibility to care for God's creations. We also included a control condition ( $N = 206$ ) and a religion condition ( $N = 203$ ), which presented a more generic religious message. As demonstrated in a mediation model, the stewardship manipulation (vs. control condition) increased feelings of guilt and anger toward environmental issues, which in turn increased support for pro-environmental policies (i.e., behavioral outcome of petition signing). Based on bootstrapped confidence intervals, the indirect effects of the stewardship prime on environmental policy support via guilt and anger were significant. In contrast, the religion condition had no significant effect on policy support. These findings contribute to explaining how religious people, tasked with the duty of stewardship, may be emotionally driven to engage with environmental issues.

*Keywords:* stewardship belief, emotion, religiosity, pro-environmentalism, environmental policy

*Supplemental materials:* <https://doi.org/10.1037/rel0000499.supp>

Religion is, for many across cultures, a guide for making sense of the world and discerning between right and wrong. Religious teachings exert a strong influence over people's attitudes toward societal issues and social behavior (Donahue & Nielsen, 2005; Jelen, 1990). Given that religion as a belief system may shape conceptions of the relationship between humans and the environment, much research has examined religion as a predictor of individuals' environmental concerns and actions (e.g., Arbuckle & Konisky, 2015; Eom, Saad, & Kim, 2021; Hand & Van Liere, 1984; Zemo & Nigus, 2021).


Early literature has posited a negative link between religiosity and pro-environmentalism. This is because religious teachings—particularly those in Judeo-Christianity—may establish dualism between humans and nature, with the former having mastery over the latter (Hand & Van Liere, 1984; White, 1967). While some research has supported this view (e.g., Arbuckle & Konisky, 2015; Clements et al., 2014; Eckberg & Blocker, 1989), other empirical findings have shown that being religious is not necessarily associated with anti-environmental attitudes and behaviors (Hayes & Marangudakis, 2001; Martin & Bateman, 2014), and that religiosity is often even positively correlated with pro-environmentalism (Mostafa, 2016; Zemo & Nigus, 2021).

To further understand how religion may promote pro-environmentalism, recent literature has focused on investigating the effects of specific religious beliefs rather than religiosity in general (e.g., K. A. Johnson et al., 2017; Joshi & Rahman, 2019). Religious stewardship—the belief that humans have been entrusted with the duty to care for God's creations, including the natural environment and the species of life within it—is one such belief that has significant implications for pro-environmental attitudes and behavior. Messages about religious environmental stewardship are present in major world religions, particularly in Abrahamic faiths. For example, it is written in the Bible that, “The Lord God took the man and put him in the Garden of Eden to work it and take care of it (Genesis 2:15).” Similarly, Islam teaches that humans should act as *Khalifah* (stewards or guardians) of the Earth (e.g., The Qur'an 7:74).

An increasing body of research shows that stewardship belief is among the religious beliefs that promote pro-environmentalism (Eom, Tok, et al., 2021; Fang et al., 2020; Sherkat & Ellison, 2007; Shin & Preston, 2021). For example, Sherkat and Ellison (2007) found in their analysis of General Social Survey data that stewardship belief was positively associated with perceived seriousness of environmental problems and willingness to sacrifice for the environment. Similarly, Eom, Tok, et al. (2021) found that stewardship belief positively predicted a range of pro-environmental outcomes, including support for environmental organizations and donation to environmental causes. Notably, research has shown that stewardship-based messages have a significant positive influence on pro-environmental attitudes and behavioral intentions (Minton, 2020; Shin & Preston, 2021). As Shin and Preston (2021) have found in an experimental study, reading Bible passages about stewardship, compared to a control passage and a dominion passage, increased participants' intentions to behave pro-environmentally. Similarly, Minton (2020) found that religious people

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The authors have no conflicts of interest to disclose.

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who were exposed to an advertisement mentioning stewardship were less tolerant of crimes against wildlife.

The present research aims to importantly advance the literature on stewardship and environmentalism. There are a few studies uncovering the mechanism underlying the relationship between stewardship belief and pro-environmental outcomes (Eom, Tok, et al., 2021; Fang et al., 2020; Sherkat & Ellison, 2007; Shin & Preston, 2021). Based on Shin and Preston's (2021) findings, stewardship belief may promote the moralization of climate change, that is, the perception of climate change as a moral issue. Relatedly, Eom, Tok, et al. (2021) studied the role of emotion in explaining the stewardship effects. They found that guilt for environmental problems explained the link between stewardship belief and pro-environmental engagement. This makes sense given that guilt is an emotional response that may arise from committing immoral acts (G. S. Adams & Inesi, 2016). However, they focused solely on guilt without examination of other emotional processes. Thus, it is an unanswered question whether other emotions play important roles.

We propose not only guilt but also anger as a potential emotion that may explain why stewardship leads to pro-environmental action among religious individuals. If religion prescribes that humankind has a duty to care for the Earth, then environmental destruction would be a moral transgression. We posit that when stewardship is primed, thoughts about transgressions would elicit negative emotional responses, such as guilt and anger, which may motivate pro-environmental behaviors. Although both guilt and anger are emotions experienced in response to transgressions, they are distinct in terms of at whom people experience those emotions. Guilt is more often experienced by individuals who view themselves to be the transgressor (G. S. Adams & Inesi, 2016). Guilt can also be felt collectively when a group as a whole is responsible for a transgression (Piff et al., 2012; Wohl et al., 2006). For religious people, guilt is a key motivator for adhering to spiritual and moral norms (Narramore, 1974). Notably, guilt induces reparative behaviors (Tangney, 1991), which are pro-environmental behaviors in the context of environmental issues. Indeed, guilt about environmental problems has been consistently associated with pro-environmental behavior (Harth et al., 2013; Rees et al., 2014; Tam, 2019).

Anger, on the other hand, is primarily experienced by either the victim of a transgression or a third party who observes harmful or offensive actions at transgressors (Vitagliano & Barnett, 2003). In a series of studies, Royzman et al. (2014) demonstrated that anger was a predominant response to sacrilegious acts committed by others, such as the burning of religious texts. Anger can motivate observers of transgressions to either restore justice to the victims or inflict punishment on the transgressors (Nelissen & Zeelenberg, 2009). Importantly, anger, as an approach-oriented motivational state, can drive actions toward a desired goal (Carver & Harmon-Jones, 2009). In the context of the environment, for those who hold religious stewardship beliefs, this desired goal is to protect the environment and maintain it as it was entrusted to humankind. Several studies have found that anger about environmental issues motivated engagement in climate activism, personal pro-environmental behaviors, and support for environmental policies (Panno et al., 2021; Reese & Jacob, 2015; Stanley et al., 2021).

Based on the ideas above, we hypothesize that both guilt and anger toward environmental issues may explain why stewardship leads to pro-environmental engagement. When an individual holds stewardship belief, he/she is likely to view himself/herself as both a

transgressor and an observer of transgression. As a member of humankind, he/she contributes to environmental problems through their actions, such as using disposable plastic products or consuming fossil fuels. He/she also witnesses the environmental destruction caused by other humans, such as by other individuals (e.g., littering) or groups (e.g., fracking). As a result of the emotions felt in reaction to anthropogenic environmental issues, he/she may be motivated to engage in reparative behavior toward the environment and support relevant policies to approach the goal of environmental protection.

## The Present Research

In the present research, we predict that stewardship messaging promotes pro-environmental action via its increasing effects on environmental guilt and anger. To test this prediction, we provided participants with a message that highlighted environmental stewardship and examined how it affected guilt and anger about environmental problems and in turn pro-environmental action. In short, we hypothesized a mediation model from stewardship messaging to pro-environmental action through guilt and anger. Importantly, we tested this model with a behavioral outcome measure: decision-making for political engagement for sustainability. Most of the previous studies on stewardship have assessed outcomes through self-reported, attitudinal measures (Leary et al., 2016; Sherkat & Ellison, 2007). These measures may be subject to social desirability bias, and it is possible that they do not accurately reflect behavior (Lange & Dewitte, 2019). The present research offers an analysis of how experimentally primed stewardship belief affects a concrete, behavioral measure that has a significant impact on social change (i.e., signing petitions to support pro-environmental policies). Given the religious nature of the constructs in the study, we used U.S. Christians as a sample. We will visit the issue of generalizability in the discussion.

## Method

### Participants

We recruited Christians from the United States on Amazon Mechanical Turk (MTurk) using CloudResearch (<https://www.cloudresearch.com>). We targeted to recruit at least 600 participants (approximately 200 for each of the three experimental conditions). Based on an a priori power analysis conducted in G\*Power, this sample size was sufficient to detect a small-to-medium effect (Cohen's  $d = 0.30$ ) of stewardship prime on environmental policy support. This is consistent with Shin and Preston (2021), who detected significant effects of stewardship priming on pro-environmental beliefs and intentions with the similar effect size estimate and sample size. After excluding participants who reported to be non-Christians or failed either of the two attention checks,<sup>1</sup> we were left with a final sample of 604 Christians for analysis ( $M_{\text{age}} = 42.7$ ,  $M_{SD} = 14.0$ ; 62.2% females). The largest ethnic group was Caucasian American (78.1%), followed by African American (8.8%),

<sup>1</sup> After watching the assigned video for their experimental condition, participants briefly described the video contents to ensure that they were paying attention to the manipulation material. Participants in all conditions then completed an online questionnaire. In the questionnaire was a second attention check to ensure that the participants were reading the questions carefully: "This is an attention check. Please select 'Strongly Disagree' for this item."

Hispanic (5.3%), Asian American (5.6%), and other groups (e.g., Indian, Native American, Native Pacific Islander; <1.0% each group). The median family income bracket was \$50,001–\$75,001, and the median highest educational attainment was a bachelor's degree (see Table 1, for detailed information about the sample).

## Materials and Measures

### Experimental Manipulation

Participants were randomly assigned to one of the three experimental conditions: stewardship ( $n = 195$ ), religion ( $n = 203$ ), or the control condition ( $n = 206$ ). Participants in each condition were assigned a 1-min video clip to watch. Participants in the stewardship condition watched a video about caring for God's creation, featuring footage of animals and natural landscapes. It included messages such as "God's creation belongs to God ... loving God means following his biblical command that we care for his creation." In examining the effect of the stewardship message, we designed two comparison groups. First, participants

in the control condition watched a video including nonreligious content; about how to check the oil level of an engine. It depicted caring for a manmade object as compared to the natural elements presented in the stewardship video.

Second, we included another condition that covered religious content without a stewardship theme. We included this namely, religion condition to demonstrate discriminant validity; to show that the effect observed by the stewardship condition was driven by stewardship in particular but not necessarily by any religious messages. Participants in the religion condition watched a video about not feeling alone with God during challenging times. Additionally, to strengthen the stewardship manipulation, participants in the stewardship condition were presented with two statements in the guise of an agreement rating question (1 = *strongly disagree* to 7 = *strongly agree*): "Human beings should respect nature because it was created by God," ( $M = 6.21$ ,  $SD = 1.04$ ) and "We, as stewards of God, have a responsibility to take good care of the Earth and life in it" ( $M = 6.30$ ,  $SD = 0.98$ ). A similar method to make religious beliefs salient has been used in a previous study (Laurin et al., 2012).

### Environmental Guilt and Anger

Participants were asked to report how they felt about environmental problems. Participants rated their guilt (guilty, regretful, and remorseful) and anger (angry, resentful, and enraged) on a 5-point scale, from 1 = *not at all* to 5 = *extremely*. Ratings for the items were averaged to create composite scores for the two types of emotions. Ratings for both guilt ( $M = 2.56$ ,  $SD = 1.10$ ,  $\alpha = .88$ ) and anger ( $M = 2.33$ ,  $SD = 1.08$ ,  $\alpha = .88$ ) items had good internal consistency.

### Pro-Environmental Policy Support

We used petition signing as a concrete behavioral outcome (a method adapted from Kteily et al., 2016). Toward the end of the questionnaire, participants were asked whether they would like to add their MTurk IDs (as a proxy for their names) to petitions for five environmental policies organized in partnership with several environmental groups. The petitions include regulating carbon dioxide as a pollutant, adding a surcharge to electrical bills, requiring electric utilities to produce at least 20% of energy from renewable resources, providing tax rebates for people who purchase energy-efficient vehicles or solar panels, and increasing taxes on gasoline. These policy items were used by Ding et al. (2011). Support for each policy was scored as such: 1 = *add ID in opposition*, 2 = *do not add ID to petition*, and 3 = *add ID in support*. The ratings were averaged to create a composite score. Ratings of support across the five petitions had good internal consistency ( $M = 2.15$ ,  $SD = 0.46$ ,  $\alpha = .75$ ). Participants were debriefed that the petitions were fictional and meant to create a cover story for realistically assessing policy support.

### Covariates

Aside from demographic variables (namely, gender, age, education, ethnicity, and income), we also included two variables as covariates: political identification and religiosity. Political identification was rated on a 7-point scale from 1 = *strongly democrat* to 7 = *strongly republican* ( $M = 4.09$ ,  $SD = 1.79$ ). Religiosity was

**Table 1**  
*Descriptive Statistics of Sample*

Sample characteristics	<i>M (SD)/N (%)</i>
Age	42.7 (14.0)
Gender	
Male	228 (37.8%)
Female	375 (62.2%)
Ethnicity	
White Caucasian	472 (78.1%)
Non-White	132 (21.9%)
Educational attainment	
Less than high school graduate	4 (0.7%)
High school graduate	63 (10.4%)
Some college	129 (21.4%)
Associate's degree	84 (13.9%)
Bachelor's degree	214 (35.4%)
Master's degree or higher	110 (18.2%)
Income	
Under \$15,000	27 (4.5%)
\$15,001–\$25,000	46 (7.6%)
\$25,001–\$35,000	50 (8.3%)
\$35,001–\$50,000	93 (15.4%)
\$50,001–\$75,000	158 (26.2%)
\$75,001–\$100,000	96 (15.9%)
\$100,001–\$150,000	92 (15.2%)
Over \$150,000	42 (7.0%)
Religiosity	
1 = Not at all religious	19 (3.1%)
2	66 (10.9%)
3	69 (11.4%)
4	88 (14.6%)
5	160 (26.5%)
6	121 (20.0%)
7 = Very much religious	81 (13.4%)
Political identification	
Strongly democrat	59 (9.8%)
Moderately democrat	74 (12.3%)
Weakly democrat	82 (13.6%)
Independent	148 (24.5%)
Weakly republican	80 (13.2%)
Moderately republican	102 (16.9%)
Strongly republican	59 (9.8%)

rated on a 7-point scale from 1 = *not at all religious* to 7 = *very much religious* ( $M = 4.64$ ,  $SD = 1.64$ ).

## Results

Table 2 shows the descriptive statistics of the study variables and the bivariate correlations between them. Both guilt and anger were positively correlated with policy support. We noted that there was a high correlation between guilt and anger ( $r = 0.70$ ,  $p < .001$ ).<sup>2</sup> Republican identity was consistently negatively correlated with environmental guilt ( $r = -0.30$ ,  $p < .001$ ), anger ( $r = -0.36$ ,  $p < .001$ ), and policy support ( $r = -0.36$ ,  $p < .001$ ).

We examined our hypothesized mediation model. For the experimental conditions, we created two dummy variables, with the control condition as the reference group. The first dummy variable represented the contrast between the control condition versus stewardship condition, and the second dummy variable represented the contrast between the control condition versus religion condition. In the mediation model, the conditions (i.e., stewardship condition vs. control condition and religion condition vs. control condition) were entered as independent variables, anger and guilt were entered as parallel mediators, and support for pro-environmental policies was entered as the outcome. For the analysis, we used the lavaan package in R 4.1.1 with maximum likelihood estimator and 10,000 bootstrap draws. We report results with covariates below (Figure 1 and Table 3). Note that there was no noticeable difference in the results with (Table 3) and without covariates (enclosed in Supplemental Material).

First, the stewardship condition (vs. control condition)<sup>3</sup> had significant positive effects on guilt ( $\beta = 0.132$ ,  $b = 0.310$ ,  $SE = 0.105$ ,  $z = 2.966$ ,  $p = .003$ , 95% CI of  $b = [0.109, 0.518]$ ) and anger ( $\beta = 0.107$ ,  $b = 0.246$ ,  $SE = 0.101$ ,  $z = 2.425$ ,  $p = .015$ , 95% CI of  $b = [0.051, 0.448]$ ), such that those who were primed with stewardship reported greater environmental guilt and anger compared to the participants in the control condition. The religion condition, on the other hand, had no significant effect on guilt and anger when compared to the control condition. Both guilt ( $\beta = 0.223$ ,  $b = 0.091$ ,  $SE = 0.024$ ,  $z = 3.794$ ,  $p < .001$ , 95% CI of  $b = [0.045, 0.138]$ ) and anger ( $\beta = 0.164$ ,  $b = 0.068$ ,  $SE = 0.025$ ,  $z = 2.708$ ,  $p = .007$ , 95% CI of  $b = [0.018, 0.117]$ ) in turn positively predicted pro-environmental policy support. Overall, there were significant indirect effects of stewardship condition on policy support through guilt ( $\beta = 0.029$ ,  $b = 0.028$ ,  $SE = 0.012$ , 95% CI of  $b = [0.008, 0.056]$ ) as well as anger ( $\beta = 0.017$ ,  $b = 0.017$ ,  $SE = 0.010$ , 95% CI of  $b = [0.002, 0.039]$ ). That is, the stewardship prime indirectly increased support for environmental policies through guilt and anger.

However, we note that overall, the stewardship condition (vs. control condition) had no significant total effect on policy support (i.e., the effect of the stewardship condition on policy support without controlling for mediators;  $\beta = 0.015$ ,  $b = 0.014$ ,  $SE = 0.043$ ,  $z = 0.330$ , 95% CI of  $b = [-0.068, 0.100]$ ). After accounting for the indirect effects through guilt and anger, the remaining direct effect of the stewardship prime was negative and nonsignificant ( $\beta = -0.031$ ,  $b = -0.031$ ,  $SE = 0.041$ ,  $z = -0.764$ ,  $p = .445$ , 95% CI of  $b = [-0.111, 0.049]$ ). Similarly, for the religion (vs. control) prime, the total ( $\beta = 0.013$ ,  $b = 0.013$ ,  $SE = 0.043$ ,  $z = 0.290$ ,  $p = .771$ , 95% CI of  $b = [-0.072, 0.097]$ ) and direct effects ( $\beta = -0.008$ ,  $b = -0.008$ ,  $SE = 0.040$ ,  $z = -0.193$ ,  $p = .847$ , 95% CI of  $b = [-0.086, 0.071]$ ) on policy support were also nonsignificant.

For the covariates (Table 3), consistent with the bivariate correlations above, we found that stronger identification as a republican negatively predicted guilt ( $\beta = -0.305$ ,  $b = -0.188$ ,  $SE = 0.025$ ,  $z = -7.643$ ,  $p < .001$ , 95% CI of  $b = [-0.236, -0.139]$ ), anger ( $\beta = -0.370$ ,  $b = -0.223$ ,  $SE = 0.025$ ,  $z = -8.994$ ,  $p < .001$ , 95% CI of  $b = [-0.271, -0.174]$ ) and policy support ( $\beta = -0.214$ ,  $b = -0.054$ ,  $SE = 0.011$ ,  $z = -5.011$ ,  $p < .001$ , 95% CI of  $b = [-0.075, -0.032]$ ). Female gender positively predicted guilt ( $\beta = 0.135$ ,  $b = 0.307$ ,  $SE = 0.089$ ,  $z = 3.457$ ,  $p \leq .001$ , 95% CI of  $b = [0.131, 0.482]$ ) and being of a minority ethnic group (i.e., non-White) negatively predicted anger ( $\beta = -0.104$ ,  $b = -0.270$ ,  $SE = 0.108$ ,  $z = -2.494$ ,  $p = .013$ , 95% CI of  $b = [-0.480, -0.056]$ ).

As additional exploratory analyses, we examined potential moderation in the paths in our mediation model (Table 4). Specifically, we tested whether religiosity or political identification moderates the effects of experimental manipulation. We found that religiosity significantly moderated the effect of religion condition (vs. control condition) on anger ( $\beta = -0.113$ ,  $b = -0.134$ ,  $SE = 0.065$ ,  $z = -2.063$ ,  $p = .039$ , 95% CI of  $b = [-0.264, -0.007]$ ). Higher religiosity attenuated the effect of religious messaging on increasing anger about environmental problems. Other than this, there was no significant moderation by religiosity or political identification in the effects of experimental conditions. We also explored if socioeconomic variables (i.e., income and education) moderated the effect of guilt or anger on environmental policy support because individuals with greater socioeconomic resources may be more likely to express their emotions through actions (i.e., stronger association between environmental emotions and policy support; Eom et al., 2018; Kraus et al., 2012). None of the interaction terms turned out to be significant. Overall, we did not find that the results varied significantly depending on demographic factors.

## Discussion

Our tested mediation model provides evidence for the emotional pathways linking stewardship belief and pro-environmental action. Specifically, when primed with stewardship belief, religious people were more likely to feel guilt and anger toward environmental issues, which in turn motivated them to sign petitions to protect the environment. These findings suggest that even a brief reminder of stewardship can effectively induce emotions, such as guilt and anger, that can powerfully motivate actions to address environmental issues among religious individuals. The present research, therefore, underscores the potential that faith-based environmental

<sup>2</sup> We tested for multicollinearity by fitting a linear regression model with both guilt and anger predicting policy support. The variance inflation factor was  $< 4$ , suggesting no serious multicollinearity issues. Therefore, we decided to continue treating the two types of emotions as separate variables.

<sup>3</sup> We tested another model using the religion condition as the reference group to directly compare the stewardship condition and the religion condition. The stewardship condition (vs. religion condition) had no significant effects on guilt ( $\beta = 0.086$ ,  $b = 0.202$ ,  $SE = 0.104$ ,  $z = 1.934$ ,  $p = .053$ , 95% CI of  $b = [0.000, 0.406]$ ) and anger ( $\beta = 0.041$ ,  $b = 0.095$ ,  $SE = 0.102$ ,  $z = 0.928$ ,  $p = .354$ , 95% CI of  $b = [-0.106, 0.293]$ ). There were also no significant indirect effects on support for environmental policies via either guilt ( $\beta = 0.019$ ,  $b = 0.018$ ,  $SE = 0.011$ , 95% CI of  $b = [-0.000, 0.041]$ ) or anger ( $\beta = 0.007$ ,  $b = 0.006$ ,  $SE = 0.008$ , 95% CI of  $b = [-0.007, 0.024]$ ). Overall, the total effect of stewardship condition (vs. control condition) was not statistically significant ( $\beta = 0.002$ ,  $b = 0.002$ ,  $SE = 0.043$ , 95% CI of  $b = [-0.084, 0.085]$ ).

**Table 2**  
*Means and Standard Deviations of the Variables and Bivariate Correlations Between Them*

Variable	M (SD)	1	2	3	4	5	6
1. Policy support	2.15 (0.46)	—					
2. Guilt	2.56 (1.10)	0.40***	—				
3. Anger	2.33 (1.08)	0.39***	0.70***	—			
4. Religiosity	4.64 (1.64)	-0.13**	-0.08	-0.13***	—		
5. Republican identification	4.09 (1.79)	-0.36***	-0.30***	-0.36***	0.23***	—	
6. Income	4.94 (1.81)	0.02	0.00	0.01	-0.02	0.06	—
7. Education	4.28 (1.30)	0.05	0.03	0.01	-0.01	-0.03	0.35***

\*\*  $p < .01$ . \*\*\*  $p < .001$ .

messages can have a substantial impact on sustainable behaviors (Hitzhusen & Tucker, 2013), especially given the sizeable proportion of religious people on Earth.

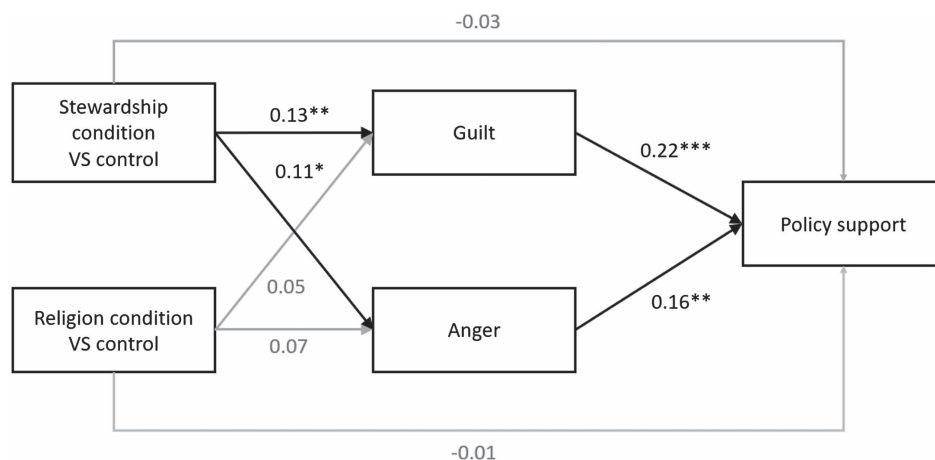
We note, however, that in our study, that effect sizes were relatively small. There was no direct main effect of stewardship prime on our outcome variable. Only the indirect effects through emotions were significant. This could be because our study used a behavioral outcome rather than self-report measures of pro-environmental intentions. Literature notes that pro-environmental intentions are a step removed from actual behavior (Ajzen, 1991; Grimmer & Miles, 2017), and this may have contributed to the relatively small effects reported in our study. Moreover, our study used stewardship messaging rather than stewardship belief as a predictor variable. As shown by a previous study (Eom, Tok, et al., 2021), stewardship manipulations had modest effects on stewardship belief. Stronger manipulation may be needed given that the independent and dependent variables are relatively distant.

Thus, an important question for future work is how the pro-environmental effects of stewardship messaging can be strengthened. To influence behavioral change, the messenger (i.e., information source) can be just as important as the content of the message.

Messengers who are deemed by an individual to be more knowledgeable or part of the in-group have stronger persuasive power (Cohen, 2003; Durantini et al., 2006; Flores et al., 2022). This is because people evaluate the credibility of information based on where it comes from, especially when polarizing issues such as politics are involved. It would be interesting to study how religious figures are perceived as sources of information about environmental issues and their influence on sustainable behavior. Religious leaders, such as the Pope, for example, may be influential as elite members of the in-group (Landrum et al., 2017; Schuldt et al., 2017). Compared to the anonymous videos we showed in the online experiment, a stewardship message from a religious authority may yield a larger effect on environmental behavior. However, religious leaders as messengers are still limited in that they may not be perceived as experts on environmental issues. People who are seen as both expert and part of the in-group, that is, religious scientists, may hold even stronger potential as messengers (Flores et al., 2022).

We also noted that given the positive (nonsignificant) coefficients for religion priming (vs. control condition) and nonsignificant differences between the stewardship condition and the religion

**Figure 1**  
*Mediation Model Results Showing the Associations Between Experimental Condition, Environmental Emotions and Environmental Policy Support Model Was Controlled for Political Identification, Religiosity, Income, Education, Gender, Ethnicity, and Age*



*Note.* Standardized path coefficients are shown. Black lines represent significant paths ( $p < .05$ ), and the gray line represents a nonsignificant path ( $p > .05$ ).  
\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

**Table 3**  
Unstandardized and Standardized Coefficients for the Mediation Model With Covariates

Parameter	<i>b</i> (SE)	95% CI	$\beta$	Z score	<i>p</i> value
Predicting guilt					
Stewardship condition → guilt	0.31 (0.10)	[0.11, 0.51]	0.13	3.00	.003
Religion condition → guilt	0.11 (0.11)	[-0.10, 0.32]	0.05	1.03	.303
Republican identification → guilt	-0.19 (0.03)	[-0.24, -0.14]	-0.31	-7.64	<.001
Religiosity → guilt	-0.02 (0.03)	[-0.07, 0.03]	-0.03	-0.69	.491
Income → guilt	0.00 (0.03)	[-0.05, 0.05]	0.01	-0.12	.908
Education → guilt	0.02 (0.03)	[-0.05, 0.09]	0.03	0.68	.495
Gender (female) → guilt	0.31 (0.09)	[0.13, 0.48]	0.14	3.46	<.001
Ethnicity (non-White) → guilt	-0.16 (0.12)	[-0.39, 0.07]	-0.06	-1.39	.164
Age → guilt	-0.00 (0.00)	[-0.01, 0.00]	-0.02	-0.60	.547
Predicting anger					
Stewardship condition → anger	0.25 (0.10)	[0.05, 0.45]	0.11	2.42	.016
Religion condition → anger	0.15 (0.10)	[-0.05, 0.35]	0.07	1.48	.140
Republican identification → anger	-0.22 (0.03)	[-0.27, -0.17]	-0.37	-8.99	<.001
Religiosity → anger	-0.04 (0.03)	[-0.09, 0.02]	-0.06	-1.34	.179
Income → anger	0.01 (0.02)	[-0.03, 0.06]	0.02	0.59	.553
Education → anger	-0.00 (0.03)	[-0.07, 0.06]	0.01	-0.11	.908
Gender (female) → anger	0.08 (0.09)	[-0.09, 0.25]	0.04	0.94	.350
Ethnicity (non-White) → anger	-0.27 (0.11)	[-0.48, -0.06]	-0.10	-2.49	.013
Age → guilt	-0.00 (0.00)	[-0.01, 0.00]	-0.02	-0.60	.546
Predicting policy support					
Stewardship condition → policy support	-0.03 (0.04)	[-0.11, 0.05]	-0.03	-0.76	.445
Religion condition → policy support	-0.01 (0.04)	[-0.08, 0.07]	-0.01	-0.19	.847
Guilt → policy support	0.09 (0.02)	[0.05, 0.14]	0.22	3.79	<.001
Anger → policy support	0.07 (0.03)	[0.02, 0.12]	0.16	2.71	.007
Republican identification → policy support	-0.05 (0.01)	[-0.08, -0.03]	-0.21	-5.01	<.001
Religiosity → policy support	-0.01 (0.01)	[-0.04, 0.01]	-0.05	-1.28	.201
Income → policy support	0.01 (0.01)	[-0.01, 0.03]	0.03	0.63	.527
Education → policy support	0.01 (0.01)	[-0.02, 0.04]	0.04	0.91	.363
Gender (female) → policy support	0.05 (0.04)	[-0.02, 0.12]	0.05	1.38	.168
Ethnicity (non-White) → policy support	0.06 (0.04)	[-0.02, 0.15]	0.06	1.42	.154
Age → policy support	-0.00 (0.00)	[-0.00, 0.00]	-0.01	-0.27	.788

Note. SE = standard error; CI = confidence interval.

condition (see footnote 3), our results suggest that religion priming has some pro-environmental effects as well, though it may be less powerful than a specific stewardship prime. It may be the case that religion priming activates stewardship belief to some extent or other factors that may promote pro-environmental attitudes and behavior. Relatedly, Eom, Tok, et al. (2021) showed that a prime of a powerful god increased stewardship belief. Thus, although the religion

condition in our study offered a conservative test for the effects of stewardship priming, more research is needed to better understand the effects of religion priming on environmental outcomes. Directly measuring what is specifically primed by religion and how they affect environmental attitudes and behavior would be useful.

The emotional pathways we presented can be further elaborated on. Psychological literature distinguishes between different types of

**Table 4**  
Moderation Effects in the Mediation Model With Covariates

No.	Dependent variable Interaction term	A. Guilt			B. Anger			C. Policy support		
		<i>b</i> (SE)	$\beta$	<i>p</i> value	<i>b</i> (SE)	$\beta$	<i>p</i> value	<i>b</i> (SE)	$\beta$	<i>p</i> value
1.	Republican Identification × Stewardship Condition	0.00 (0.06)	0.00	.957	-0.00 (0.06)	-0.00	.997	0.01 (0.02)	0.03	.610
	Republican Identification × Religion Condition	0.05 (0.06)	0.05	.401	0.04 (0.05)	-0.04	.417	0.02 (0.02)	0.04	.449
2.	Religiosity × Stewardship Condition	-0.05 (0.06)	-0.04	.425	-0.11 (0.06)	-0.09	.084	0.04 (0.03)	0.08	.118
	Religiosity × Religion Condition	-0.06 (0.07)	-0.05	.384	-0.13 (0.06)	-0.11	.039	0.01 (0.03)	0.03	.582
3.	Income × Guilt							0.01 (0.01)	0.03	.448
4.	Income × Anger							-0.00 (0.01)	-0.02	.574
5.	Education × Guilt							-0.00 (0.01)	-0.00	.998
6.	Education × Anger							-0.01 (0.01)	-0.02	.682

Note. SE = standard error.

guilt and anger that the present study did not explore in detail. By identifying the specific types of guilt and anger that stewardship belief evokes, research can define the range of behavioral outcomes that can be influenced by stewardship messaging. Guilt, for instance, can be classified as either personal guilt or collective guilt (Ferguson & Branscombe, 2010). Perhaps, personal guilt is related to performing private pro-environmental behaviors, such as recycling and household energy conservation (I. Adams et al., 2020). Collective guilt, on the other hand, may be more relevant to regulating group behavior (Maitner et al., 2007). Political engagement through signing petitions, as we have examined in this study, may be one way that an individual participates in collective action.

Regarding anger, the specific targets can vary. For example, for environmental problems, the anger of religious people with stewardship belief can be more toward others, ingroup (i.e., Christians), or themselves (i.e., anger at oneself; Ellsworth & Tong, 2006). Given that anger is an approach-oriented emotion that often drives behaviors to change the undesired situation (Carver & Harmon-Jones, 2009), anger may generally increase pro-environmental actions, as we found in the present study. However, what kinds of actions are more likely to occur may differ by specific targets of anger. For example, when anger is more toward others, people may be more supportive of actions that are considered as punishing those who they think have harmed the environment (e.g., companies involved in fracking business). In this case, though, people may be more reluctant to support changes that involve self-sacrifice. In comparison, when anger is toward ingroup or oneself, the sinners or perpetrators are themselves, so people may be more willing to accept changes in personal lifestyle that bring them inconvenience, sacrifice, and burdens for the environment.

Relatedly, although we have examined anger and guilt as mediators that link the relationship between stewardship and pro-environmental action, advancing the literature, there may be other emotions that play significant roles. Fear and pride are other probable mediators. Past research shows that stewardship belief is related to being more aware of (Fang et al., 2020), or perceiving greater seriousness (Sherkat & Ellison, 2007) of the consequences of environmental issues. People who hold stewardship beliefs may be more fearful of what environmental destruction may bring, not just based on what scientists have predicted but the reaction expected from a god as well. Previous studies have demonstrated that the fear of divine punishment can motivate religious people to behave in a pro-social and cooperative way (Atkinson & Bourrat, 2011; D. Johnson, 2005). Failing to fulfill stewardship duties may evoke fear of punishment from God, which can take place in the form of natural disasters on earth (Haq & Ahmed, 2017), or negative judgment in the afterlife (Atkinson & Bourrat, 2011). People who hold stewardship belief may behave pro-environmentally to avoid such negative repercussions. Conversely, fulfillment of stewardship duties may bring about a sense of pride, an emotion that arises when people think that they have lived up to personal or societal standards (Tracy & Robins, 2004). Religious people may see performing environmental behaviors as a means of fulfilling their divine duties. They may anticipate a sense of pride that comes with performing behaviors such as recycling, as it demonstrates being a good steward. Studies have found that the anticipated pride, in addition to experienced pride following a desirable behavior, can motivate pro-environmental action (Onwezen et al., 2013; Schneider et al., 2017).

Finally, it should be noted that beliefs and teachings are diverse, both between religions and within the same religion. Because the present sample was limited to U.S. Christians, future studies can verify the robustness of the findings by testing the effects of stewardship messages on more varied samples (e.g., with other countries or religions). The size and direction of the effects of stewardship prime may be influenced by the unique cultural features of each sample. As noted in some previous studies, some U.S. Christians, aside from their faith, may also be characterized by politically conservative beliefs (O'Brien & Abdelhadi, 2020; Sherkat et al., 2011). Though we included political identification as a control variable in analysis, there may still be other unique characteristics among the sample that were not accounted for. Moreover, the United States is known to have an individualistic culture that favors the expression of personal beliefs, which may include stewardship belief. Thus, it is probable that stewardship belief, when it is primed, may predict behavior more strongly in the current sample compared to one taken from a collectivistic culture (see Eom et al., 2016; Kim & Lawrie, 2019), especially if social norms do not encourage pro-environmental actions. There remains much room for future research to examine variability in the impacts of stewardship belief and related messages across cultures.

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