Green as the Gospel: The Power of Stewardship Messages to Improve Climate Change Attitudes

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Abstract

Three studies (N 1,389) investigate how attitudes toward the environment and climate change may be informed by stewardship beliefs (care for the Earth as a sacred religious duty) or dominion beliefs (God-given dominance over nature). Proenvironmental measures were positively associated with stewardship belief and negatively associated with dominion belief, moderated by religiosity (Study 1). When religious participants read passages from the Bible supporting stewardship, they expressed greater concern for climate change, compared with those who read dominion messages or a control passage (Study 2). Reading the pro-environmental encyclical by Pope Francis increased participants' belief in and moralization of climate change, but this was moderated by favorable attitudes toward the Pope. These findings suggest that environmental attitudes can be shaped by views of religious authorities and present an optimistic view that environmental stewardship can be used to improve concern for climate change among religious believers.

Keywords: environmental concern, religion, stewardship, climate change, environment

Introduction

In June 2015, Pope Francis released an encyclical titled "*Laudato si'*" that encouraged individuals to consider the consequences of climate change and to take action against environmental degradation. In reference to Biblical narratives, Pope Francis advocated that it is humankind's sacred duty to be stewards of the Earth, protect its resources, and "till and keep the garden of the world" (Francis, 2015). Similarly, other religious leaders advance a *stewardship* position towards the Earth and interpret scriptures as God ordering humans to take care of and protect (but not rule) His creation (Wilson, 2012). These efforts could increase Americans' concerns about climate change, as well as the belief that climate change is a moral or religious issue (Maibach, Leiserowitz, Roser-Renouf, Myers, Rosenthal, & Feinberg, 2015; Schuldt, Pearson, Romero-Canyas, & Larson-Konar, 2017). The majority of Americans (57%) share this view and endorse the idea that human beings are given the "task of living responsibly with the animals, plants, and resources of the planet" (Cox & Piacenza, 2015).

Such findings may seem at odds with the idea that Christians hold negative attitudes toward the environment and climate change (White, 1967; Roser-Renouf, Maibach, Leiserowitz, & Rosenthal, 2016; Clements, McCright, & Xiao, 2014). Indeed, some religious organizations (e.g., the Cornwall Alliance, a conservative evangelical Christian group) propose that God has charged humans with dominion over nature and advocate that the Earth is "robust, resilient, … and admirably suited for human flourishing" (Cornwall Alliance, 2000). The *dominion* viewpoint explicitly proposes that God created the Earth to serve humans and that it is our right to take advantage of the environment for profit. Some research supporting this association has found that Christians are more likely to have a mastery perspective on nature, which contributes to lower

concern for the environment (Hand & Van Liere, 1984; Eckberg & Blocker, 1989). Though only a minority of Americans (35%) endorse the idea that "God gave human beings the right to use the animals, plants, and all the resources of the planet for human benefit" (Cox & Piacenza, 2015), this is partly dependent on factors such as denomination and race (Cox & Piacenza, 2015).

Stewardship and dominion stances therefore represent two opposing religious viewpoints on God's intended relationship between humans and the Earth. But which of these stances do religious believers follow? Likely, religious people's moral stances toward the environment are shaped, in part, by views advocated by their religious leaders. Religious ideas and texts can be interpreted in various ways to support opposing moral points of view (for the environment and other issues as well), and religious authorities play a role in communicating these ideas to their congregation. A majority of churchgoers (64%) report that their clergy have spoken out on social-political issues, such as, religious liberty, homosexuality, abortion, immigration, environmental issues, and economic inequality (Pew Research Center, 2016). Those who reported hearing about environmental issues in church (47%) reported hearing mostly pro-environmental messages – either to protect and clean up the environment (29%), be aware of current environmental issues (20%), practice conservation (11%), or messages containing explicit religious themes (such as, to care for God's creation) (10%) (Pew Research Center, 2010).

Individuals in religious communities may be especially influenced by stewardship messages on the environment. Previous research has shown that attitudes on social and political issues come to resemble the normative opinion of their congregation or clergy (Djupe & Gilbert, 2009; Wald, Owen, & Hill, 1988). Beliefs that are sanctioned and sanctified by a religion –

through endorsement by authority figures or a shared viewpoint with the group – can influence members' stances on issues (Djupe & Gilbert, 2009; Jelen, 1992; Huckfeldt & Sprague, 1995; Wald et al., 1988). Social influences, such as the congregation and clergy's views on the environment, are also much stronger predictors of environmental attitudes than individual religious belief or religiosity (Djupe & Hunt, 2009), and therefore should play a role in shaping individuals' attitudes towards climate change.

We argue here that messages from religious authorities that advocate environmental stewardship should increase believers' concern for climate change and the environment. Previous survey data has demonstrated that stewardship and dominion beliefs mediate the relationship between religiosity and self-reported sustainable behavior (Leary, Minton, & Mittelstaedt, 2016). However, very little work has examined how stewardship or dominion beliefs can be used to shift or manipulate attitudes towards the environment and climate change. One experimental study demonstrated that brief exposure to a picture of Pope Francis increases people's belief in climate change as a moral issue, as well as feelings of personal responsibility for its effects (Schuldt et al., 2017). We hope to extend this research by demonstrating that stewardship beliefs from multiple authority sources (e.g., Pope Francis, religious texts) can be used to increase environmental concern. We also examine whether reminding individuals of dominion beliefs has a negative impact on climate change concern. Using both correlational and experimental evidence, we demonstrate that environmental attitudes advocated by a religious source can influence climate change attitudes.

Important, in these studies we study both *belief* and *moralization* of climate change issues. Moralization of climate change differs from belief in that it measures the extent to which people consider environmental problems as moral issues with moral implications and is an

important predictor of intentions and actions regarding conservation (Salomon, Preston, & Tannenbaum, 2017). Given that religion is strongly connected with moral beliefs (McKay & Whitehouse, 2014; Norenzayan & Shariff, 2008; Preston, Salomon, & Ritter, 201), religious authorities should also have an important impact on moralization of climate change. *Stewardship* in particular presumes a moral stance for caring and nurturing (whereas dominion attitudes presume an entitled stance). Thus, we expect that *stewardship* messages may be especially effective in improving moral concerns for climate change, though we also test whether dominion messages have a deleterious effect on environmental attitudes when advocated by religious source.

Study 1

Study 1 examined the relationship between stewardship belief, dominion belief, climate change attitudes, and religious beliefs (religiosity, Spirituality, Fundamentalism) in a correlational design.

Method

Note on sample size. We aimed to collect at least 85 participants to be able to detect a small sized effect (r = 0.30) with 80% power.

Participants. This research was conducted in accordance with the ethical regulations of the American Psychological Association and approved by the IRB (#14172) at the University of Illinois at Urbana-Champaign. 303 participants were recruited from Amazon's Mechanical Turk service for a small fee. 11 participants were excluded due to duplicate IP addresses, leaving N = 292 participants (155 females, 43% no affiliation, 49% Christian, 8% other religions). We report all measures, manipulations, and exclusions in these studies.

Measures. Participants completed three scales to assess climate change attitudes, a Stewardship/ Dominion scale, and three scales to measure religious beliefs. All measures were completed on 7-point Likert scales (1 = *strongly disagree*, 7 = *strongly agree*). See Appendix for all items.

For the climate change measures, participants completed two items to measure belief in human-caused climate change (e.g., "The release of carbon dioxide from human activity is causing climate change."), a 6-item Climate Change Moralization scale to assess moral attitudes toward global warming and energy conservation (e.g., "It is morally wrong to consume a lot of fossil fuels."), and a 9-item Revised New Ecological Paradigm scale (NEP) that assesses perceptions of humans' relationship with nature, and whether humans can/ should control nature (e.g., "We are approaching the limit of the number of people the Earth can support") (Dunlap, Liere, Mertig, & Jones, 2000).

Next, participants completed a 3-item Dominion scale, i.e., whether the Bible or God promotes using the land for its resources (e.g., "God wants people to use nature and its resources for our own prosperity.") and a 3-item Stewardship scale, i.e., whether the Bible or God promotes people taking care of the Earth (e.g., "The Bible promotes people taking care of the Earth.").

People completed three scales to assess religious beliefs: a 7-item General Religiosity scale (Preston & Ritter, 2013) to measure broad religious beliefs and how these beliefs relate to their personal identity ("I believe strongly in the teachings of my religion or faith"), a 9-item Religious Fundamentalism scale to measure belief in fundamental truths and teachings (e.g., "To lead the best, most meaningful life one must belong to the one fundamentally true religion";

Altemeyer & Huntsberger, 2004), and a shortened 8-item Spiritual Transcendence scale (e.g., "Spirituality is an important part of who I am as a person."; Piedmont, 1999).

As part of pretesting purposes for another study, participants completed a 6-item Awe scale (Shiota, Keltner, and John, 2006), 5-item Compassion scale (Shiota et al., 2006), 5-item Purity scale (adapted from Graham, Nosek, Haidt, Iyer, Koleva, & Ditto, 2011), and 5-item Pride scale (Shiota et al., 2006). However, we included these scales as exploratory analyses for the purposes of another project, and because these scales are not relevant to this work, we will not discuss them further here.

Results and Discussion

Reliabilities and means were calculated for all measures: Climate Change Beliefs (α = .88), Climate Change Moralization (α = .85), NEP (α = .82), Stewardship (α = .80), Dominion (α = .69), General Religiosity (α = .97), Fundamentalism (α = .93), and Spirituality (α = .92).

Correlations. Climate change measures were strongly correlated with each other (*rs* > .55, $p < .001$), and religious measures were also strongly correlated with each other (*rs* > .47, $p < .001$). Stewardship and dominion beliefs were moderately, positively correlated with one another ($r = .30$, $p < .001$). As expected, religious measures positively correlated with both Stewardship beliefs and Dominion beliefs (*rs* > .36, $p < .01$).

To test our main hypotheses, zero-order correlations were conducted between the Stewardship and Dominion measures with target environmental measures (Belief, Moralization, and NEP) and religious measures. We also conducted first-order correlations controlling for political ideology. We report zero-order and first-order correlations below. Stewardship belief was positively correlated with Climate Change Moralization ($r = .32$, $p < .001$; $r_{partial} = .42$, $p < .001$), whereas Dominion belief was negatively correlated with Moralization ($r = -.26$, $p < .001$;

$r_{partial}$ = -.15, p = .01). Stewardship belief was positively correlated with NEP scale (r = .14, p < .01; $r_{partial}$ = .25, p < .001), whereas Dominion belief was negatively correlated (r = -.53, p > .001; $r_{partial}$ = -.44, p < .001). Dominion belief was also negatively correlated with Belief in climate change, (r = -.28, p < .001; $r_{partial}$ = .42, p < .001). Stewardship belief was not correlated with belief in climate change, except when controlling for political ideology (r = .04, p > .05; $r_{partial}$ = .18, p =.002).

Moderation. A substantial proportion of participants identified as non-religious, but the relationship between Stewardship/Dominion beliefs and climate change attitudes was expected to be strongest amongst individuals who identify as Christian (49% of the sample). We tested whether Christian affiliation moderates the relationship between Stewardship/ Dominion beliefs and the climate change measures. We ran separate linear regressions for each of our dependent measures using Christian affiliation (0 = non-Christian, 1 = Christian), a centered mean of Steward/Dominion, and an interaction of Christian x Steward/Dominion as predictors. See Figure 1 for graphs of interaction effects. For Stewardship beliefs, the interaction was significant for Climate Change Moralization (b = .30 [.11, .49], t(284) = 3.15, p = .002), Climate Change Belief (b = .31 [.07, .56], t(284) = 2.57, p = .01), and NEP (b = .19 [.03, .36], t(284) = 2.33, p = .02), suggesting that Christians who hold stewardship beliefs report greater concern for climate change. For Dominion beliefs, the interaction was significant for Climate Change Moralization (b = -.34 [-.57, -.11], t(284) = -2.87, p = .01) and Climate Change Beliefs (b = -.30 [-.57, -.04], t(284) = -2.25, p = .03) but not NEP (b = -.12 [-.29, .04], t(284) = -1.49, p = .14), suggesting that Christians who hold Dominion beliefs are less likely to be concerned about Climate Change.

These data suggest that Christians' beliefs about the biblical stance on the environment may play a role in their attitudes toward the environment. However, this data is correlational. In

Studies 2 and 3 we use experimental manipulations to present stewardship and dominion messages, ostensibly supported by religious authorities, to observe their influence on environmental attitudes.

[insert Figure 1]

Study 2

Study 2 used an experimental design to test whether stewardship or dominion messages from a respected religious source (the Bible) affect the attitudes and beliefs of religious people. In a three-group design, participants read a news article that framed biblical scripture as supporting either (1) a stewardship or (2) dominion view, or (3) a control article. Participants then completed measures of climate change attitudes. We predicted that messages advocating stewardship beliefs would especially impact individuals' *moralization* of climate change. Stewardship belief advocates the idea that people should care for God's creation and have a responsibility to protect nature and its resources. This presumes a *moral* stance, especially regarding ideas of harm and care, and so should impact moral attitudes towards climate change. However, the effects of manipulating dominion belief are less certain. Dominion belief presumes that humans have the right to rule over nature and its resources. The idea that humans are entitled to nature's resources may not convince people to moralize or belief in climate change less, but instead may serve to justify why people can abuse the environment.

Method

Note on sample size. We aimed to collect at least 176 participants per condition (518 total) to be able to detect a small sized effect between two conditions (Cohen's $d = 0.30$; two-sided hypothesis) with 80% power.

Participants. 600 participants were recruited from Amazon's Mechanical Turk service for a small fee. Because we wanted to test the effects of religious authority, we pre-screened for participants who identified as Christian. 12 participants were omitted because they later identified as Atheist or Agnostic, leaving 588 participants.

Procedure. Participants were told that the study was about how people process and recall religious material and that they would be asked to read some parts of the Bible with interpretations. Participants were randomly assigned to receive one of three articles: a dominion article, stewardship article, or control article. The Dominion article discussed how St. Thomas Aquinas and other Christians support the idea that God wants people to benefit from Earth's resources and use it for their needs. In order to support this argument, several quotes from Bible scriptures (e.g., and God said to them, "Be fruitful and multiply, and fill the Earth, and subdue it; and rule over the fish of the sea and over the birds of the sky, and over every living thing that moves on the Earth") were used. The Stewardship article discussed how St. Thomas Aquinas and other Christians believe that humans should protect the Earth and act as stewards of God's sacred land. As in the other condition, Bible scriptures were referenced to support the argument (e.g., "When you lay siege to a city for a long time, fighting against it to capture it, do not destroy its trees by putting an axe to them, because you can eat their fruit. Do not cut them down. Are the trees of the field people, that you should besiege them?" Deuternomy 20:19). The control article discussed the popularity of various Christian names.

Measures. Following the article, participants were asked to summarize the information that they had just read. Participants then responded to two statements about Stewardship belief ("Caring for the earth is our sacred duty as humans", "God wants humans to protect nature and its resources") and two statements about Dominion belief ("Humans have God-given rights to use nature as we choose", "God wants humans to take advantage of Earth and its resources"). All items were on 7-point scales (1-strongly disagree, 7 – strongly agree).

Participants completed two of the measures from Study 1: Climate Change Beliefs and Climate Change Moralization. Participants also completed a 5-item scale to measure their intentions to engage in environmentally friendly behaviors (e.g., "I intend to change my habits that harm the environment, such as leaving lights on."). To measure religious beliefs, participants completed two of the measures from Study 1: General Religiosity and Spirituality.

Results

We calculated means and reliabilities for all measures: Climate Change Beliefs ($\alpha = .89$), Climate Change Moralization ($\alpha = .90$), Climate Change Intentions ($\alpha = .94$), General Religiosity ($\alpha = .95$), and Spirituality ($\alpha = .90$).

Stewardship/Dominion. We tested whether the manipulation affected participants' belief in whether the Bible promotes taking care of the Earth (stewardship) or using the land for human needs (dominion). A one-way ANOVA revealed significant group differences in believing that the Bible promotes dominion belief, ($F(2, 590) = 6.85$, $p = .001$, $\eta_p^2 = .023$) and stewardship belief, ($F(2, 590) = 9.49$, $p = .001$, $\eta_p^2 = .025$). Planned contrasts revealed that the steward article ($M = 6.33$, $SD = .97$) increased belief that the Bible promotes taking care of the Earth compared to the control condition ($M = 5.89$, $SD = 1.20$, $t(602) = 3.91$, $p < .001$) and dominion condition ($M = 6.06$, $SD = 1.15$, $t(602) = 2.44$, $p = .02$). Likewise, the dominion article

(M = 4.34, SD = 1.78) increased belief that the Bible promotes using the land for human needs compared to the steward article (M = 3.66, SD = 1.84, $t(602) = -3.63$, $p < .001$) and control condition (M = 3.91, SD = 1.77, $t(602) = -2.44$, $p = .02$).

Climate Change Measures. One-way ANOVAs on condition were conducted for the three climate change measures (see Table 1 for means). Overall means were significantly different for Climate Change Beliefs ($F(2, 590) = 3.28$, $p = .04$, $\eta_p^2 = .01$) and Climate Change Moralization ($F(2, 590) = 4.89$, $p = .01$, $\eta_p^2 = .02$), and a marginal effect for Climate Change Intentions ($F(2, 590) = 2.58$, $p = .08$, $\eta_p^2 = .01$). Planned contrasts for Climate Change Belief indicated that the difference between the Stewardship (M = 5.46, *SD* = 1.68) and Control condition was significant (M = 5.01, *SD* = 1.74l; $t(590) = 2.56$, $p = .01$*)* but not the difference between the Dominion (M = 5.18, *SD* = 1.77) and Control conditions *(*M = 5.01, *SD* = 1.74; $t(590) = 1.05$, $p = .30$*).* Likewise, for Climate Change Moralization, the difference between the Stewardship (M = 4.86, *SD* = 1.34) and Control condition was significant (M = 4.41, *SD* = 1.47; $t(590) = 3.13$, $p = .002$*)* but not the difference between the Dominion (M = 4.60, *SD* = 1.49) and Control condition *(*M = 4.41, *SD* = 1.47; $t(590) = 1.38$, $p = .17$*).* For Climate Change Intentions, the difference between the Stewardship (M = 5.38, *SD* = 1.34) and Control condition was significantly different ((M = 5.08, *SD* = 1.42); $t(590) = 2.08$, $p = .04$), but the difference between the Dominion (M = 5.10, *SD* = 1.53) and Control was not significant (M = 5.08, *SD* = 1.42; $t(590) = .13$, $p = .90$). This suggests that stewardship messages can increase climate change concern, while dominion messages may have a very small or non-significant effect.

[insert Table 1]

Mediation

We tested whether the positive effects of the Stewardship condition on the target climate change measures were mediated by the two-item Stewardship measure. We centered all variables to reduce multicollinearity effects. To test for mediation, we used the Sobel test for mediation with bootstrap estimation for coefficients (Preacher & Hayes, 2004). When Stewardship belief and condition predicted belief in climate change, Stewardship belief (b = .60 [.46, .75], t = 8.36, p < .001) was a significant predictor but condition was not (Stewardship =1, Control =0) (b = .18 [-.14, .50], t = 1.12, p = .26), indicating mediation by Stewardship belief (indirect effect = .26 [.13, .42], SE = .07). Similarly, Stewardship belief (b = 0.74 [0.63, 0.84], t = 13.84, p < 0.001) significantly predicted Climate Change Moralization, but condition did not (b = 0.13 [-.10, .37], t = 1.10, p = 0.27), indicating mediation by Stewardship belief (indirect effect estimate = 0.32 [0.17, 0.49], SE = 0.08). Stewardship belief also significantly mediated the relationship between condition and Climate Change Intentions (indirect effect estimate = 0.31 [0.16, 0.47], SE = 0.06).

Discussion

In Study 2, biblical stewardship messages increased participants' moralization of climate change, belief in climate change, and intentions to engage in environmentally friendly behavior compared to the control. However, we did not see a parallel effect where dominion messages diminished climate change attitudes. This suggests there is greater malleability in enhancing people's concern for climate change, rather than diminishing it. Endorsement of dominion belief was lower than belief in environmental stewardship in Study 1, and is generally low in the general population (Cox & Piacenza, 2015) and so there may be greater general resistance to dominion attitudes. It may also be more difficult to diminish concern for climate change, considering that an increasing number of people in the United States (45%) report worrying "a

great deal about climate change" (Saad, 2017) and also report climate change as a top threat to national security (Poushter & Manevich, 2017). This suggests an optimistic implication for religious environmental activism: framing climate change in terms of a moral issue that resonates with religious individuals (i.e., caring for God's creation) can increase both moral concern for climate change and intentions to reduce consumption.

Study 3

In Study 3, we were interested in how environmental messages from a religious authority figure can impact attitudes and beliefs. Authority figures, especially ones who are perceived as legitimate (French & Raven, 1959; Jost & Major, 2001) can effectively persuade individuals to change their beliefs and social values. Participants were presented with passages from Pope Francis' 2015 encyclical *Laudato si'*, in which he strongly advocates for environmental stewardship as a sacred duty, and then responded to climate change measures. Compared to the two control conditions, we expected greater climate change belief, moralization, and intentions after reading passages from the encyclical. Importantly, we predicted that effects of the stewardship message would be strongest amongst individuals who have favorable opinions of the Pope. Persuasive messages are effective to the extent that people believe the source is credible and/or trustworthy (Petty & Wegener, 1998; Pornpitakpan, 2004). Likewise, we expect that exposure to Pope Francis' encyclical will affect attitudes toward climate change due to the authoritative influence of religion. This study builds upon previous research that has found priming participants with images of Pope Francis can increase perceptions of climate change as a moral issue and feelings of personal responsibility in mitigating its effects, especially for those aware of the Pope's stewardship attitudes toward the environment (Schuldt et al., 2017). Here we

expose participants to the Pope's message in the encyclical. Of course, the Pope only has an authoritative influence to the extent that he is deemed a trustworthy, favorable moral authority. In Study 3, we therefore examine whether more favorable perceptions of Pope Francis moderate the effect of the manipulation on climate change attitudes.

Method

Note on sample size. We aimed to collect at least 139 participants per condition to detect a small sized effect (Cohen's $d = 0.30$; one-tailed hypothesis) with 80% power. 176 participants are needed per condition to detect a small-sized effect ($d = .3$) with a two-tailed hypothesis.

Participants. 502 participants were recruited from Amazon's Mechanical Turk service for a small fee. 4 participants were removed for duplicate IP addresses, leaving 498 participants (254 females, 37% no affiliation, 52% Christian, 11% other religions).

Procedure. Participants were told to read a short news article and answer some questions about their attitudes and beliefs. Participants were randomly assigned to receive one of three articles: an article about the Pope advocating for environmental stewardship (Pope-Stewardship), an article about the Pope's stance on birth control (Pope-control), or a neutral article about nutrition labeling in Canada (Neutral-control). The Pope-Stewardship referenced direct quotes from *Laudato Si'* and explained that Pope Francis has urged people to "preserve creation and to care for the environment." The Pope-control article discussed how the Catholic Church continues to oppose birth control. Afterwards, participants were asked to write about the article that they had just read in their own words.

Measures. Participants then completed three measures from Studies 2: Climate Change Beliefs, Climate Change Moralization, and Climate Change Intentions. Next, participants

responded to two Stewardship/Dominion items: "Scriptures from the Bible promote humans taking care of the Earth" and "Scriptures from the Bible promote humans using the Earth for their own benefit and profit." Both items were on respective 7-point scales (1 = *strongly disagree,* 7 = *strongly agree*). To measure religious beliefs, participants completed the General Religiosity scale from Study 1 and 2. At the end of the study, participants were asked for their opinion on Pope Francis (1 = *very unfavorable,* 7 = *very favorable),* how Pope Francis is doing compared to his predecessor (1 = *much poorer job*, 7 = *much better job),* and whether they knew Pope Francis' stance on environmental issues or abortion (*1 = very unfamiliar,* 7 = *very familiar*). Finally, participants answered demographic questions.

Results

We calculated means and reliabilities for all measures: Climate Change Beliefs (α = 0.88), Climate Change Moralization (α = 0.89), Climate Change Intentions (α = 0.93), and General Religiosity (α = 0.98).

Stewardship belief. We tested whether the manipulation affected participants' belief in whether the Bible promotes taking care of the Earth (stewardship) or using the land for human needs (dominion). Overall differences in means were not significant for the three groups for Stewardship belief ($F(2, 495) = 1.89$, $p = .15$, $\eta_p^2 = .01$) or Dominion Belief ($F(2, 495) = 1.008$, $p = .37$, $\eta_p^2 = .00$). However, planned contrasts (weights: 2 = Pope stewardship, -1 = Pope-control, -1 = Neutral-control) showed expected significant differences between the Pope stewardship article and two control articles on Bible Stewardship ($t(496) = 1.96$, $p = .05$, $d = 0.18$ [-.004, 0.37]). As expected, there were no significant differences for belief that the Bible promotes Dominion ideas ($t(496) = -1.00$, $p = .32$, $d = .09$).

One-way ANOVAs on condition were conducted for the three climate change measures (see Table 2 for means). There were significant differences between the overall group means for Climate Change Moralization ($F(2, 495) = 4.19$, $p = .02$, $\eta_p^2 = .02$) and Climate Change Beliefs ($F(2, 495) = 3.11$, $p = .05$, $\eta_p^2 = .01$), but not Climate Change Intentions ($F(2, 495) = 1.18$, $p = .31$; $\eta_p^2 = .01$). We predicted that the Pope stewardship article would increase climate change concern compared to the two control articles. Planned contrasts (2 = Pope stewardship, -1 = Pope control, -1 = Neutral control article) revealed significant differences between the Pope article and two control articles for belief in climate change, (t (495) = 2.55, $p = 0.01$, $d = 0.23$ [0.04, 0.41]), and moralization of climate change, (t (495) = 2.38, $p = .02$, $d = .24$ [.06, .43]). However, unlike Study 2, there were no significant differences for Climate Change Intentions ($t(496) = 1.51$, $p = .14$, $d = .14$[-.04, .33]).

[insert Table 2]

Attitudes Toward Pope Francis. We examined whether attitudes towards the Pope varied by condition. A one-way ANOVA indicated that the Pope Stewardship condition (M = 5.33, *SD* = 1.47) indicated higher favorability ratings than the Pope Control (M = 4.85, *SD* = 1.44) or Neutral Control article (M = 4.81, *SD* = 1.50; $F(2, 495) = 6.38$, $p = .002$). We tested whether attitudes towards Pope Francis moderated the effect of condition on climate change attitudes. We computed a mean of two favorability questions about Pope Francis: "What is your opinion of Pope Francis?" and "Compared to his predecessors, how well is Pope Francis doing as Pope?" We ran separate linear regressions for each of our dependent measures using condition (0 = Control Conditions, 1 = Environmental), a centered mean of Pope Attitudes, and an interaction

of centered Pope Attitudes x Condition as predictors. The interaction was not significant for Climate Change Beliefs (b = 0.11 [-0.06, 0.28], $t(494) = 1.30$, p = .20), but was significant for Climate Change Moralization (b = 0.21 [0.07, 0.35], $t(494) = 2.88$, p = 0.004) and Climate Change Intentions (b = 0.19 [0.04, 0.34], $t(494) = 2.53$, p = 0.01), suggesting that individuals who had favorable opinions of the Pope reported greater moralization and intentions after reading the article (although the main effect of condition on intentions was not significant; see Figure 2).

[insert Figure 2]

Discussion

In Study 3, participants who read an article about Pope Francis advocating environmental stewardship reported increased belief in and moralization of climate change compared to the two control conditions. These results suggest that religious authority figures can have a positive influence on people's attitudes toward climate change. Unlike Study 2, there was no significant effect of condition on Climate Change Intentions, but this suggests that the effect of stewardship messages on specific behavior may be weaker than general belief and attitudes. As expected, participants' ratings of Pope Francis moderated the effect of condition on climate change attitudes, indicating that the influence of religious authority on environmental attitudes relies on the favorability towards the authority figure.

General Discussion

Religion is a powerful source of moral values and beliefs that may shape believers' responses to the present climate change crisis. What these results demonstrate is that stewardship messages, if they come from trusted religious sources, can have a positive effect on concern for

climate change and the environment among American Christians. Study 1 found correlational evidence that stewardship beliefs are positively associated with moralization of climate change and the NEP scale, whereas dominion beliefs are negatively associated with moralization of climate change, belief in climate change, and NEP scale. In Study 2, participants who read an article containing scriptures about environmental stewardship reported increased concern for the three target climate change measures (compared to the control condition), and mediation analyses suggest that the 2-item stewardship belief index mediates these effects. Further, results from Study 3 suggest that stewardship messages from a religious authority figure (Pope Francis) can increase participants' belief in and moralization of climate change.

In contrast to stewardship messages, dominion messages (advocating human dominance over nature) seemed to have little or no effect on environmental concerns. In Study 2, the article containing scriptures about dominion belief did not lower participants' concern (belief, moralization, intentions) compared to the control condition. One reason may be that Christians have a lower baseline for environmental attitudes (Arbuckle & Konisky, 2015; Morrison, Duncan, & Parton, 2015), and so there is more room to impact attitudes in a positive direction. However, our own data from Study 1 show that baseline support for dominion attitudes is relatively low. This is at odds with notions that religious Americans are not concerned with the environment, rather, suggests that the idea humans should dominate and control nature may have less influence or support among believers to begin with, and so has less power to change attitudes.

Overall these findings present an optimistic picture that beliefs about environmental stewardship can be used to increase individuals' belief in and moralization of climate change. In general, framing climate change (and other issues) in moral terms has a better chance of

persuading and influencing people's opinions (Markowitz & Shariff, 2015; Van Zant & Moore, 2015), and more specifically, framing climate change in terms of moral values can increase pro-environmental attitudes and behavior (Feinberg & Willer, 2013; Wolsko, Ariceaga, Seiden, 2016). Framing climate change in terms of religious moral values (stewardship for God's creation) can positively influence people's concern for climate change.

Admittedly the observed effect sizes are relatively small, but this does not mean they are irrelevant. Climate change is a hotly debated and politicized issue, and we should expect that people have fairly set attitudes towards these questions. Any change to these attitudes is resisted by already existing beliefs on these issues. However, the fact that there was an effect speaks to the power of stewardship messages to influence attitudes, particularly among American Christians. One question, however, is whether this difference in attitudes represents an actual (e.g. more enduring) shift or just a temporary change in reporting due to social desirability bias. Further research should examine the long-term effects of religious messages on climate change and whether it has any meaningful impact on behavior. Over time, more association between stewardship messages and religious authority may meaningfully shift general attitudes toward the environment and pro-environmental behavior. With an increasingly polarized political climate in the United States, there is a growing need for other channels of communication to promote environmental concern. Given that, more than eight in ten people identify with an organized religion worldwide, appealing to religious beliefs and framing climate change in religious moral terms can play a powerful role in increasing people's engagement and belief in environmental concern.

References

Altemeyer, B., & Hunsberger, B. (2004). A revised religious fundamentalism scale: The short and sweet of it. *The International Journal for the Psychology of Religion*, *14*(1), 47-54.

Arbuckle, M. B., & Konisky, D. M. (2015). The role of religion in environmental attitudes. *Social Science Quarterly*, *96*(5), 1244-1263.

Clements, J. M., McCright, A. M., & Xiao, C. (2014). Green Christians? An empirical examination of environmental concern within the US general public. *Organization & Environment*, *27*(1), 85-102.

Cornwall Alliance. (2000). The Cornwall declaration on environmental stewardship. *Burke, VA: Cornwall Alliance*.

Cox, D., & Piacenza, J. (2015). Majority of Catholics for Religious Stewardship, One-Third Say God Gave Humans Dominion Over Earth. Retrieved September 23, 2017, from https://www.prri.org/spotlight/majority-of-catholics-for-religious-stewardship-one-third-say-god-gave-humans-dominion/

Djupe, P. A., & Gilbert, C. P. (2008). *The political influence of churches*. Cambridge University Press.

Djupe, P. A., & Hunt, P. K. (2009). Beyond the Lynn White thesis: Congregational effects on environmental concern. *Journal for the Scientific Study of Religion*, *48*(4), 670-686.

Dunlap, R. E., Van Liere, K. D., Mertig, A. G., & Jones, R. E. (2000). New trends in measuring environmental attitudes: measuring endorsement of the new ecological paradigm: a revised NEP scale. *Journal of social issues*, *56*(3), 425-442.

Eckberg, D. L., & Blocker, T. J. (1989). Varieties of religious involvement and environmental

concerns: Testing the Lynn White thesis. *Journal for the Scientific Study of Religion*, *28*(4), 509-517.

Feinberg, M., & Willer, R. (2013). The moral roots of environmental attitudes. *Psychological Science*, *24*(1), 56-62.

Francis, P. (2015). *Laudato si: On care for our common home*. Our Sunday Visitor.

French, J. R., Raven, B., & Cartwright, D. (1959). The bases of social power. *Classics of organization theory*, *7*.

Greeley, A. (1993). Religion and attitudes toward the environment. *Journal for the Scientific Study of Religion*, *32*(1), 19-28.

Graham, J., Nosek, B. A., Haidt, J., Iyer, R., Koleva, S., & Ditto, P. H. (2011). Mapping the moral domain. *Journal of personality and social psychology*, *101*(2), 366.

Hand, C. M., & Van Liere, K. D. (1984). Religion, mastery-over-nature, and environmental concern. *Social Forces*, *63*(2), 555-570.

Huckfeldt, R. R., & Sprague, J. (1995). *Citizens, politics and social communication: Information and influence in an election campaign*. Cambridge University Press.

Jelen, T. G. (1992). Political Christianity: A contextual analysis. *American journal of political science*, *36*(3), 692-714.

Jost, J. T., & Major, B. (Eds.). (2001). *The psychology of legitimacy: Emerging perspectives on ideology, justice, and intergroup relations*. Cambridge University Press.

Leary, R. B., Minton, E. A., & Mittelstaedt, J. D. (2016). Thou shall not? The influence of religion on beliefs of stewardship and dominion, sustainable behaviors, and marketing systems. *Journal of Macromarketing*, *36*(4), 457-470.

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.

Markowitz, E. M., & Shariff, A. F. (2012). Climate change and moral judgement. *Nature Climate Change*, *2*(4), 243-247.

McKay, R., & Whitehouse, H. (2015). Religion and morality. *Psychological bulletin*, *141*(2), 447.

Morrison, M., Duncan, R., & Parton, K. (2015). Religion does matter for climate change attitudes and behavior. *PloS one*, *10*(8), e0134868.

Norenzayan, A., & Shariff, A. F. (2008). The origin and evolution of religious prosociality. *science*, *322*(5898), 58-62.

Petty, R. E., & Wegener, D. T. (1998). Matching versus mismatching attitude functions: Implications for scrutiny of persuasive messages. *Personality and Social Psychology Bulletin*, *24*(3), 227-240.

Pew Research Center. (2010). Few Say Religion Shapes Immigration, Environment Views, from http://www.pewforum.org/2010/09/17/few-say-religion-shapes-immigration-environment-views/

Pew Research Center. (2016). Many Americans Hear Politics From the Pulpit. Retrieved July 05, 2017, from http://www.pewforum.org/2016/08/08/many-americans-hear-politics-from-the-pulpit/

Piedmont, R. L. (1999). Does spirituality represent the sixth factor of personality? Spiritual transcendence and the five-factor model. *Journal of personality*, *67*(6), 985-1013.

Pornpitakpan, C. (2004). The persuasiveness of source credibility: A critical review of five

decades' evidence. *Journal of applied social psychology*, *34*(2), 243-281.

Poushter, J., & Manevich, D. (2017, August 01). Globally, People Point to ISIS and Climate Change as Leading Security Threats. Retrieved September 21, 2017, from http://www.pewglobal.org/2017/08/01/globally-people-point-to-isis-and-climate-change-as-leading-security-threats/

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior research methods*, *36*(4), 717-731.

Preston, J. L., Salomon, E., & Ritter, R. S. (2013). Religious prosociality. *Religion, personality, and social behavior*, 149-169.

Preston, J. L., & Ritter, R. S. (2013). Different effects of religion and God on prosociality with the ingroup and outgroup. *Personality and Social Psychology Bulletin*, *39*(11), 1471-1483.

Roser-Renouf, C., Maibach, E., Leiserowitz, A., & Rosenthal, S. (2016). Global Warming, God, and the "End Times". Yale University and George Mason University. New Haven, CT: Yale Program on Climate Change Communication.

Saad, L. (2017, March 14). Global Warming Concern at Three-Decade High in US. Retrieved September 21, 2017, from http://news.gallup.com/poll/206030/global-warming-concern-three-decade-high.aspx

Salomon, E., Preston, J. L., & Tannenbaum, M. B. (2017). Climate change helplessness and the (de) moralization of individual energy behavior. *Journal of Experimental Psychology: Applied*, *23*(1).

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.

Shiota, M. N., Keltner, D., & John, O. P. (2006). Positive emotion dispositions differentially associated with Big Five personality and attachment style. *The Journal of Positive Psychology*, *1*(2), 61-71.

Van Zant, A. B., & Moore, D. A. (2015). Leaders' use of moral justifications increases policy support. *Psychological science*, *26*(6), 934-943.

Wald, K. D., Owen, D. E., & Hill, S. S. (1988). Churches as political communities. *American political science review*, *82*(2), 531-548.

White, L. (1967). The historical roots of our ecologic crisis. *Readings in biology and man*.

Wilson, L. (2012). 'Churches Embrace the Genesis Covenant, Seek GreenFaith Certification. *Episcopal News Service*.

Wolsko, C., Ariceaga, H., & Seiden, J. (2016). Red, white, and blue enough to be green: Effects of moral framing on climate change attitudes and conservation behaviors. *Journal of Experimental Social Psychology*, *65*, 7-19.

Figure 1. Interactions between Stewardship/Dominion Belief with Religious Affiliation for Dependent Climate Change Variables

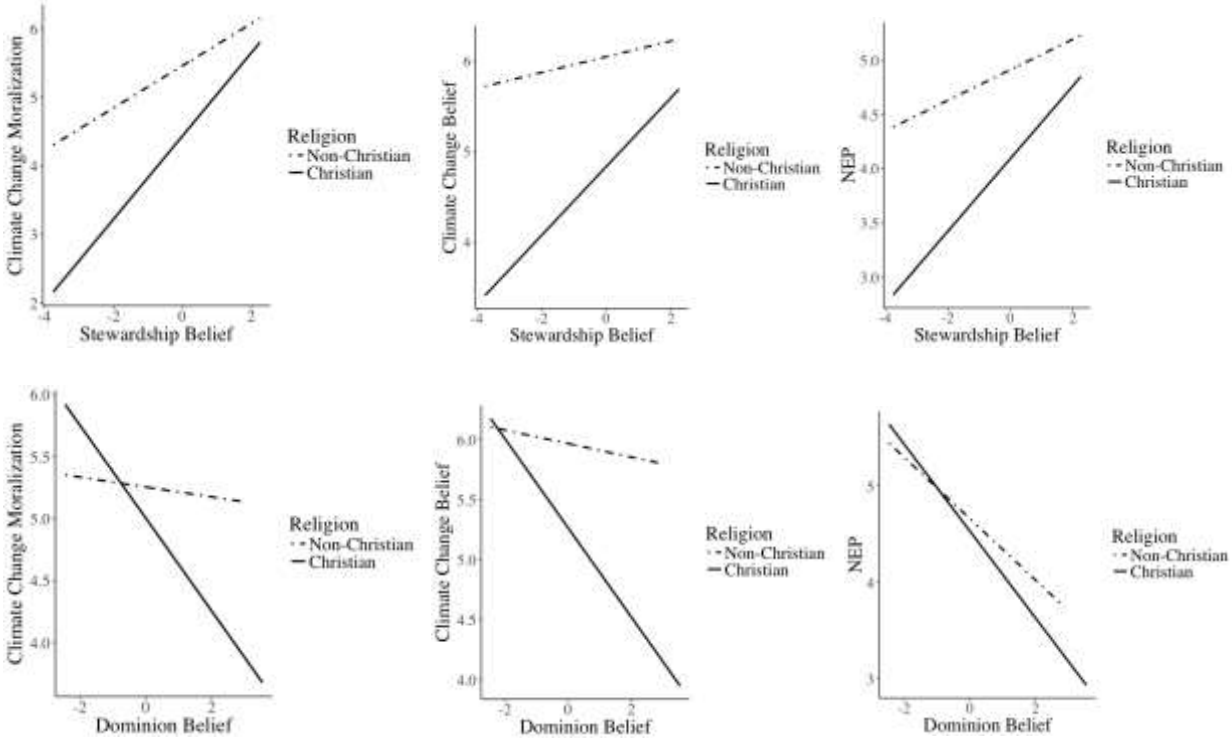


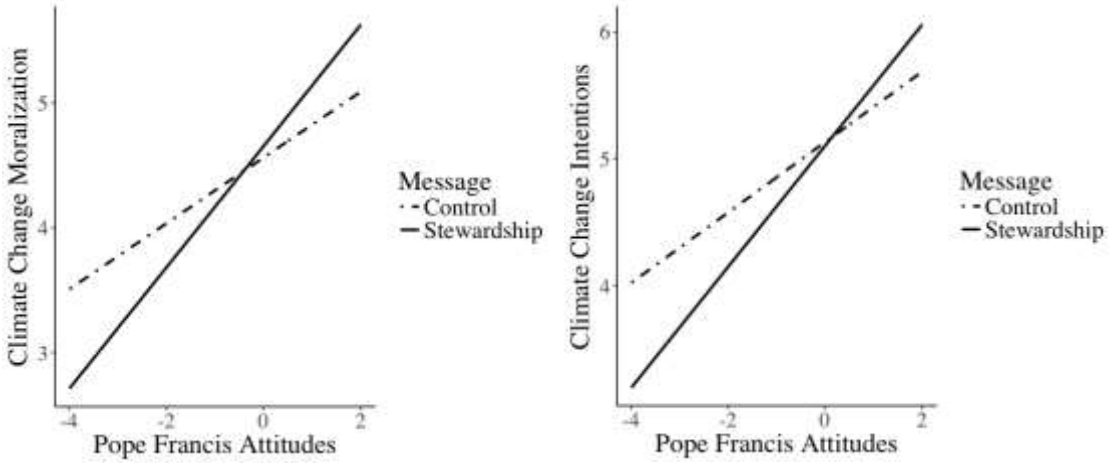
Table 1. Climate Change Measures Means by Condition.

	Stewardship		Dominion		Control	
Measure	M	*SD*	M	*SD*	M	*SD*
Belief	5.45	*(1.68)*	5.18	*(1.77)*	5.00	*(1.74)*
Moralization	4.86	*(1.35)*	4.60	*(1.49)*	4.40	*(1.48)*
Intentions	5.38	*(1.34)*	5.10	*(1.53)*	5.08	*(1.42)*

Table 2. Climate Change Measures Means by Condition.

	Pope Stewardship		Pope Control		Neutral Control	
Measure	M	*SD*	M	*SD*	M	*SD*
Belief	5.86	*(1.34)*	5.59	*(1.50)*	5.47	*(1.51)*
Moralization	4.81	*(1.18)*	4.42	*(1.18)*	4.61	*(1.28)*
Intentions	5.27	*(1.32)*	5.07	*(1.20)*	5.11	*(1.32)*

Figure 2. Interaction between Pope Francis Attitudes x Condition for Global Warming Moralization and Intentions



Appendix

Measures from Study 1

Climate Change Belief

1. Scientific evidence points to a warming trend in climate.
2. The release of CO_2 (carbon dioxide) from human activity is causing climate change.

Climate Change Moralization (Study 1)

1. It is morally wrong to consume a lot of fossil fuels.
2. Environmental issues are moral concerns.
3. It is our moral duty to protect the environment.
4. People should feel guilty if they throw recyclable items into the garbage.
5. It is not important to worry about protecting the Earth (R).
6. Global warming is not a moral issue (R).

Climate Change Moralization (Study 3)

1. It is morally wrong to consume a lot of fossil fuels.
2. Environmental issues are moral concerns.
3. It is morally wrong to throw recyclable items in the trash.
4. Recycling is morally good.
5. Using disposable shopping bags is morally wrong.
6. Preventing global warming decreases suffering in others.

Climate Change Intentions (Study 2)

1. I intend to replace light bulbs in my home with more energy efficient bulbs.
2. I intend to set my thermostat/heater no higher than 65F in the winter.
3. I intend to set my thermostat/air conditioning no lower than 75F in the summer.
4. I intend to use the washing machine only when I have a full load.
5. I intend to use a clothesline instead of a dryer when possible.
6. I intend to recycle at home.
7. I intend to buy recycled paper.
8. I intend to drink tap water over bottled beverages when possible.
9. I intend to use a reusable or recycled shopping bag instead of disposable bags.
10. I intend to drive less/not at all.
11. I intend to vote for politicians who support environmental initiatives.
12. I intend to write to my representatives about environmental concerns.

Climate Change Intentions (Study 3)

1. I intend to decrease my consumption of fossil fuels.
2. I intend to be conscientious about environmental issues.
3. I intend to change my habits that harm the environment (e.g., wasting energy, leaving lights on).
4. I intend to do my part to protect the environment.
5. I intend to increase habits that help the environment (e.g., recycling, taking the bus).

New Ecological Paradigm

1. We are approaching the limit of the number of people the Earth can support.
2. Humans have the right to modify the natural environment to suit their needs (R).
3. When humans interfere with nature it often produces disastrous consequences.
4. Human ingenuity will insure that we do not make the Earth unlivable (R).
5. Humans are severely abusing the environment.
6. The Earth has plenty of natural resources if we just learn how to develop them (R).
7. Humans are meant to rule over the rest of nature (R).
8. The balance of nature is very delicate and easily upset.
9. Humans will eventually learn enough about how nature works to be able to control it (R).
10. If things continue on their present course, we will soon experience a major ecological catastrophe.

General Environmental (Study 2)

1. The Amazon rainforest is threatened because of industrial deforestation and logging.
2. New forms of clean and renewable energy need to be adopted for the benefit of future generations.
3. The use of technology to alter nature, such as Genetically Modified Organisms (GMO), is necessary to support the growing human population (R).
4. The importance of the economy and industry trumps the need to be concerned for the environment (R).
5. Humans should be allowed to modify nature to benefit our species (R).
6. The world's oceans are in a vulnerable state due to overfishing and chemical pollution.
7. The environmental movement is a threat to the economy and weakens our nation's stability (R).
8. It is up to humans to lessen current environmental problems.
9. Bee colonies are collapsing due to chemicals and an environmental imbalance caused by humans.
10. Eating local food is important to less humanity's environmental impact.

Stewardship Scale

1. Caring for the Earth is our sacred duty as humans
2. The Bible promotes people taking care of the Earth.
3. God wants humans to protect nature and its resources.

Dominion Scale

1. The Bible promotes people using the land for their own needs.
2. Humans have the moral right to use nature as we choose.
3. God wants humans to use nature and its resources for our own prosperity.

Standard Religious Scale

1. I believe in God.
2. My religious beliefs are very important to me.
3. If someone wanted to understand who I am as a person, my religion or faith would be very important in that.
4. I believe strongly in the teachings of my religion or faith.
5. I consider myself a religious person.
6. How often do you attend religious services? (1 = never, 7 = more than once a week)

Fundamentalism Scale

1. God has given humanity a complete, unfailing guide to happiness and salvation, which must be totally followed.
2. No single book of religious teachings contain all the intrinsic, fundamental truths about life (R).
3. It is more important to be a good person than to believe in God and the right religion (R).
4. When you get right down to it, there are basically only two kinds of people in the world: the Righteous, who will be rewarded by God; and the rest, who will not.
5. Scriptures may contain general truths, but they should NOT be considered completely, literally true from beginning to end (R).
6. To lead the best most meaningful life, one must belong to the one fundamentally true religion.
7. Whenever science and sacred scripture conflict, science is probably right (R).
8. All of the religions in the world have flaws and wrong teachings. There is no perfectly true, right religion (R).
9. The fundamentals of God's religion should never be tampered with, or compromised with others' beliefs.

Spiritual Scale

1. Spirituality is an important part of who I am as a person.
2. I believe that attention to one's spiritual growth is important.
3. My life has benefited from spirituality.
4. I have had an experience in which I seemed to be deeply connected to everything.
5. I believe that there is a larger meaning in life.
6. There is an order to the universe that transcends human thinking.
7. I feel that on a higher level all of us share a common bond.
8. All life is interconnected.