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Red, white, and blue enough to be green: Effects of moral framing on climate change attitudes and conservation behaviors

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HIGHLIGHTS

- Participants were presented with one of three different moral frames.
- Political liberals were consistent in their pro-environmental attitudes across conditions.
- Political conservatives displayed more pro-environmental attitudes after a binding moral frame.
- Attitude change was mediated by perceptions that the moral frame came from the ingroup.

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ABSTRACT

Widespread political polarization on issues related to environmental conservation may be partially explained by the chronic framing of persuasive messages in ideological and moral terms that hold greater appeal for liberals and egalitarians. A series of three experiments examined the extent to which variations in the moral framing of pro-environmental messaging affect liberals' vs. conservatives' conservation intentions, climate change attitudes, and donations to an environmental organization. While liberals did not generally differ across conditions, conservatives shifted substantially in the pro-environmental direction after exposure to a binding moral frame, in which protecting the natural environment was portrayed as a matter of obeying authority, defending the purity of nature, and demonstrating one's patriotism to the United States. This shift was pronounced when conservatives perceived the congruent appeal to be a stronger argument. Evidence of mediated moderation is also presented, in which the attitudinal and behavioral shifts for conservatives were a function of the degree to which the values present in the pro-environmental appeal were perceived as coming from the ingroup. Discussion focuses on future directions for more precisely specifying moral framing effects, and on considering the pros and cons of targeted messaging for the sustainability of environmental attitude change.

1. Introduction

It has been clearly established that there is substantial political polarization on environmental attitudes and behaviors. Relative to conservatives, liberals tend to report greater engagement in environmentally friendly behaviors, support for environmental regulation, and concern about environmental problems, such as climate change (Dunlap, Xiao, & McCright, 2001; Feygina, Jost, & Goldsmith, 2010; Gromet, Kunreuther, & Larrick, 2013; Guber, 2013; Konisky, Milyo, & Richardson, 2008; McCright & Dunlap, 2011). One recent explanation for this divergence is that environmental issues are typically framed in ideological and moral terms that hold greater appeal for liberals and egalitarians (e.g., Feinberg & Willer, 2013; Feygina et al., 2010; Kidwell, Farmer, & Hardesty, 2013). In other words, it may not be concern about the environment which is primarily being rejected by conservatives, but rather the moral tone of the prevailing environmental discourse, in which practicing "environmentalism" signifies being unfaithful to one's ingroup and associated conservative values.

A few studies have highlighted the relatively narrow and biased moral framing of environmental communications. For example, work by Clayton, Koehn, and Grover (2013) indicates that the common tendency to present environmental crises as *injustices* is not highly appealing to conservatives, and is much more consonant with the moral concerns of liberals. Similarly, Feinberg and Willer (2013) demonstrate that media communications strongly favor framing environmental issues in terms of levels of *harm* and *care*, which are more relevant to liberals than conservatives, as predicted by Moral Foundations Theory (Graham, Haidt, & Nosek, 2009; Haidt & Graham, 2007). These findings are consistent with those reported by Nisbet, Markowitz, and Kotcher (2012), who summarize the chronic emphasis of environmental campaigns on liberal morals, and argue that we need to "appeal to a greater

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bandwith of moral foundations and to be fluent in a variety of moral languages" (p. 18) (see also Markowitz & Shariff, 2012).

Mindful of the political polarization on environmental issues and the evidence that environmental discourse is prototypically presented in terms of liberal values, three recent investigations have manipulated the moral framing of environmental problems in order to examine how this may moderate conservatives' attitudes and behaviors. Feinberg and Willer (2013) found that framing pro-environmental rhetoric in terms of purity and sanctity, moral values resonating to a greater degree with conservatives (Graham et al., 2009), largely eliminated the difference between liberals' and conservatives' environmental attitudes. Kidwell et al. (2013) demonstrated that persuasive appeals congruent with conservatives' "binding" moral concerns (e.g. ingroup loyalty, respect for authority) increased conservatives' intentions to recycle and their actual recycling habits. Feygina et al. (2010) found that framing a pro-environmental message as patriotic and environmental conservation as that which will "protect and preserve the American way of life" increased high system justifiers' intentions to engage in conservation behaviors and willingness to sign a pro-environmental petition. Taken together, this research suggests that framing environmental issues in terms of values that have greater appeal to political conservatives may substantially increase pro-environmental attitudes and behaviors.

These recent efforts to shift environmental attitudes and behaviors can be valuably interpreted through the lens of persuasion research on matching effects. In general, work in this area indicates that attitude and behavior change will be greater when persuasive communications are congruent with the content, structure, and/or function of the recipient's attitude in the relevant domain (Maio & Haddock, 2015; Watt, Maio, Haddock, & Johnson, 2009). The strategic use of assorted moral and linguistic frames to alter environmental attitudes by Feinberg and Willer (2013) and others appears to be effective, at least in part, by virtue of its success in matching the self- or value-expressive functions of respondents' attitudes.

In highly politicized and contentious domains, such as with environmental issues in the U.S., the attitudes of political liberals and conservatives are likely to serve important self-expressive functions, acting as vehicles for conveying ingroup identity and core ingroup values. As Kahan (2013) explains, ideologically-motivated reasoning is often highly relevant to environmental decision-making and people may act, first and foremost, in a manner consistent with affirming their loyalty and membership in important groups. From this perspective, liberals' expression of more positive environmental attitudes may be seen as an affirmation of their liberal identity (i.e. the attitude is consistent with the attitudes of other ingroup members whom they know and like) and as an expression of their moral concerns about issues of harm/care and fairness/justice — the liberal moral preoccupations (Graham et al., 2009) in which environmental messages are prototypically framed (Clayton et al., 2013; Markowitz & Shariff, 2012). In contrast, many conservatives may generally express more negative environmental attitudes as an affirmation of their conservative identity (i.e. expressing doubt about the seriousness of climate change is consistent with the attitudes of other ingroup members) and as a rejection of the liberal voices and moral concerns that are most frequently paired with pro-environmental messages.

Just as an attitude may persist because it meets a functional need, so to, "attitude change occurs to meet a functional need" (Watt et al., 2009, p. 194). Presently, the functional need under consideration is the acknowledgement and affirmation of ingroup membership and important ingroup values. Interpreted in this manner, conservatives in Feinberg and Willer's (2013) Study 3 were able to fulfill this self-expressive function through asserting *more positive* environmental attitudes because doing so was framed as an affirmation of conservatives' moral concerns about purity and sanctity. Similarly, the more positive environmental attitudes and behavior of high system justifiers in Feygina et al.'s (2010) Study 3 fulfilled a self-expressive function because doing so became a declaration of patriotic values. For conservatives then, attitudes appear likely to shift in the pro-environmental direction under conditions in which self- or value-expressive functions can actually be fulfilled – rather than stifled, threatened, or deemed irrelevant – by agreeing with a pro-environmental agenda. Prior research suggests that moral framing may not substantially influence liberals' environmental attitudes (e.g. Feinberg & Willer, 2013), perhaps due to greater attitude internalization in this domain (see Kidwell et al., 2013, for an exception, which we return to in the General discussion section), bolstered through the chronic presentation of environmental issues in terms of liberal values.

The present investigation extends this work on environmental messaging by examining the effects of frames that completely match (vs. mismatch) the moral values of liberals vs. conservatives, as informed by Moral Foundations Theory (Graham et al., 2009). Additionally, we (1) examine the effects of these appeals on a broader range of environmental attitudes than has previously been assessed, (2) evaluate participants' subjective perceptions of the message source as a novel mediating pathway, and (3) take a first look at the relevance of perceived message strength in helping us understand this and other emerging research on moral framing.

The few prior experiments that have incorporated domains relevant to Moral Foundations Theory (MFT) in pro-environmental messages have either utilized subsets of the individualizing and binding morals or contained small confounds. For example, Feinberg and Willer (2013) manipulated only harm/care vs. purity/sanctity. Feygina et al. (2010) examined the effects of just a patriotic appeal — inspired by system justification perspectives (e.g. Jost, Glaser, Kruglanski, & Sulloway, 2003), but clearly overlapping with the ingroup/loyalty dimension of MFT. And Kidwell et al. (2013), in Studies 1 through 3, explicitly referenced purity (a conservative moral domain) only in the individualizing (liberal) appeal and did not address respect for authority figures in the binding appeal; and, in Study 4, explicitly addressed purity in both the binding and individualizing appeals.

In the present series of three experiments, participants were exposed to pro-environmental appeals that very explicitly addressed the full set of moral domains identified by Moral Foundations Theory (Graham et al., 2009): the *individualizing* domains of harm/care and fairness/reciprocity, and the *binding* domains of ingroup/loyalty, authority/respect, and purity/sanctity. In the *individualizing* condition (designed to match the moral concerns of political liberals and mismatch those of political conservatives), a pro-environmental message focused on the importance of a caring and compassionate attitude, on protecting nature from harm, and on the pursuit of fairness and justice in nature and humankind. In the *binding* condition (designed to match the moral concerns of political conservatives and mismatch those of political liberals), the message provided arguments for how a pro-environmental agenda demonstrates loyalty to the ingroup, respect for authority, maintenance of purity and sanctity in human endeavors, and patriotism and pride in the United States. In our first two experiments, some participants instead received a *control* appeal, containing a brief, generic call to address environmental issues.

In Experiment 1, we examined the effects of political orientation and moral framing condition on intentions to engage in a set of conservation behaviors and attitudes about climate change. In general, it was hypothesized that the effects of political orientation on environmental attitudes and behavior would be moderated by the moral framing of the pro-environmental appeal to which participants were exposed. In other words, we expected to see the typical political polarization in the control condition (which should mimic public opinion poll data) and in the individualizing condition (which was designed to affirm liberal, but not conservative morals). In contrast, we anticipated a relative *increase* in pro-environmental attitudes among conservatives in the binding condition, where conservative morals were affirmed, providing a functional match on identity and values for this end of the political spectrum.

From an Elaboration Likelihood Model (ELM) perspective, such a functional match for conservatives may induce attitude change via different routes, depending on the extent and manner of message processing (see Clark, 2014; Petty, Wheeler, & Bizer, 2000). Briefly, an argument that matches conservatives' binding moral foundations may alter attitudes by acting as a peripheral cue (when ability and/or motivation is lower), biasing information processing activity in favor of a particular position or identity (when ability and/or motivation is higher), or increasing the scrutiny of messages (when ability and/or motivation is otherwise unconstrained, and scrutiny is initiated by functional matching, or other increased personal relevancy). We view all of these processing pathways as potentially viable explanations for moral framing effects, depending on the specific personal and situational circumstances. In the current set of experiments, we presented participants with fairly strong arguments linking particular moral values with environmental concern and did not explicitly constrain ability or motivation to process information. This should lead to greater pro-environmental attitudes for conservatives in the binding condition, provided that there is sufficient functional matching. Rather than assessing depth of processing message content, it is this functional matching mechanism which we examined in greater detail.

To this end, in Experiment 2, we repeated the procedure from Experiment 1, added a true behavioral measure of donations to an environmental organization, and assessed a model of mediated moderation. Existing effects of moral frames on environmental attitudes have been partially explained in terms of increased feelings of disgust (among conservatives) (Feinberg & Willer, 2013) and increased perceptual fluency (Kidwell et al., 2013). Both of these mediators are consistent with what we should expect from a functional matching perspective, as messages that are congruent with one's values ought to elicit the expression of those values (disgust) and make the message "feel right" and easier to interpret (fluency). In this experiment, we assessed a previously unexamined mediator, and one that is arguably the most central to achieving functional matching effects: the respondents' subjective perception that there is a match between the content of the pro-environmental message and one's ingroup identity and associated values. Our reasoning is in line with Cohen's (2003) discussion of political matching effects, when he argues that "what is critical is social meaning – the perceived "goodness of fit" between the attitude object and socially shared values… defined by the judgments of other individuals who are trusted to share one's moral allegiances – that is, individuals who share one's social identity" (p. 809). Here, we tested whether participants' experiences of this "goodness of fit" were substantially responsible for a shift in environmental attitudes. This amounted to a test of mediated moderation, in which it was determined if the *moderating* effect of moral frame (individualizing vs. binding) on the relationship between political orientation and environmental attitudes was *mediated* by the perceived match with the identity and values of the message source.

In Experiment 3, we focused on examining the extent to which individual and condition differences in perceived message strength could explain variation in the attitudinal and behavioral changes observed, particularly for conservative participants. Existing work on moral framing has not accounted for perceptions of message strength, and it is possible that different moral frames are generally more or less effective because they convey arguments of different strengths, and not because they effectively match the moral values of respondents. Thus, at a fundamental level, it was important to examine: (1) whether the individualizing and binding messages were, on average, perceived as equivalently strong; (2) whether perceived message strength differed for liberals vs. conservatives, on average, and by condition; (3) whether perceived message strength depended on individuals' appraisals of the political identity of the message source; and (4) the extent to which perceived message strength would meaningfully predict variation in pro-environmental attitudes and behavior.

2. Experiment 1

2.1. Method

2.1.1. Participants

A total of 185 participants, sampled from introductory social science courses at a 2-year community college in the Pacific Northwest region of the United States, completed the experiment in exchange for course extra credit. Individuals at this particular educational institution tend to be older and of a broader age range than traditional college students, as reflected in the age demographics for this sample ($M = 31.63$, $SD = 8.92$). More females responded (62.2%) than males (37.8%).

2.1.2. Materials and procedure

Participants completed an anonymous survey about their "personal values and behaviors" containing the following measures. Items are described in the order that they were completed, and variable names used in subsequent analyses are highlighted.

2.1.2.1. Political orientation. First, participants completed an eight-item assessment of political orientation adapted from Nail, McGregor, Drinkwater, Steele, and Thompson (2009) and Kidwell et al. (2013). The instructions requested that participants indicate the extent to which they were in favor of or against "each of the following eight policies, practices, and political groups," on a scale ranging from 1 *strongly against* to 7 *strongly in favor*: (1) capital punishment, (2) making abortion illegal, (3) less strict gun control, (4) more socialized health care, (5) legalization of same sex marriage, (6) not punishing illegal immigration, (7) democrats, and (8) republicans. Each participant received a *political orientation score*, taken as the mean across all items (reverse scoring on items 4 through 7), such that higher scores reflected a more conservative political ideology ($\alpha = 0.75$), as constituted by greater support of conservative groups (e.g. Republicans) and policies (e.g. pro-capital punishment) in the U.S.

2.1.2.2. Moral framing manipulations. Next, participants were randomly assigned to read through information from one of the following three conditions: (1) *individualizing* morality (emphasizing harm/care and fairness/justice), (2) *binding* morality (emphasizing loyalty, authority, purity, and patriotism), or (3) *control*. In the individualizing condition, participants read through the following statement:

> Many people around the world are concerned about the health of the natural environment. We are interested in what you think and feel about this issue. First, please read through the following brief public service announcement before answering a few additional questions.
>
> Show your love for all of humanity and the world in which we live by helping to care for our vulnerable natural environment. Help to reduce the harm done to the environment by taking action. By caring for the natural world you are helping to ensure that everyone around the world gets to enjoy fair access to a sustainable environment. Do the right thing by preventing the suffering of all life-forms and making sure that no one is denied their right to a healthy planet. SHOW YOUR COMPASSION.

This message was paired with two photographs selected by the authors for consistency with the caring component of an individualizing morality: one with a woman's hands cradling a seedling growing from a small amount of soil and a second in which two young children are watering a newly planted tree.

In the binding condition, participants read through the following statement:

> Many patriotic citizens of the United States are concerned about the health of the natural environment. We are interested in what you

think and feel about this issue. First, please read through the following brief public service announcement before answering a few additional questions.

Show you love your country by joining the fight to protect the purity of America's natural environment. Take pride in the American tradition of performing one's civic duty by taking responsibility for yourself and the land you call home. By taking a tougher stance on protecting the natural environment, you will be honoring all of Creation. Demonstrate your respect by following the examples of your religious and political leaders who defend America's natural environment. SHOW YOUR PATRIOTISM!

This message was paired with two photographs selected by the authors for consistency with the patriotic/ingroup loyalty component of a binding morality: one with a bald eagle perched on a rock with a majestic mountain peak in the background and a second with an American flag waving in front of a distant mountain peak. In the control condition, participants read the following more generic introductory instructions without any photographs: "Many people are concerned about the health of the natural environment. We are interested in what you think and feel about this issue."

2.1.2.3. Conservation intentions. Next, participants were asked to consider a set of ten activities related to environmental conservation that they may or may not currently engage in (e.g., recycling, using energy saving light bulbs, composting), and to indicate how likely it is that they would regularly engage in that activity in the future on a scale ranging from 1 *extremely unlikely* to 7 *extremely likely*. Each participant received a *conservation intentions* score, taken as the mean across all 10 items, with higher numbers indicating a greater intention to engage in environmental conservation in the future.

2.1.2.4. Climate change attitudes. Finally, participants responded to a set of questions on their perceptions of climate change. The items came from Spence, Poortinga, and Pidgeon's (2012) national survey of UK residents on climate change perceptions, and included items assessing certainty (e.g., "The seriousness of climate change is exaggerated"), preparedness to act (e.g., "I am prepared to greatly reduce my energy use to help tackle climate change"), human causation (e.g., "To what extent do you think climate change is an entirely natural process vs. a process entirely caused by human activities), and concern (e.g., "How concerned, if at all, are you about climate change, sometimes referred to as 'global warming'?"). Because we were interested in examining an overall shift in climate change attitudes, rather than one specific component, we calculated a *climate change composite* variable for each participant by first standardizing each item and then taking the mean across all items. Standardization was necessary as different item categories utilized different response scales (see Spence et al., 2012). Higher scores on this variable indicated that participants were more certain that climate change was happening, more prepared to act, more concerned about climate change, more likely to think that climate change was human caused, and more likely to think that we will see the effects of climate change soon.

Table 1
Descriptive statistics and correlations between political orientation and environmental dependent variables (Experiment 1).

	M	*SD*	Political orientation	Conservation intentions	Climate change composite
Political orientation	3.67	0.99	–		
Conservation intentions	5.73	0.95	−0.47***	–	
Climate change composite	0.00	0.71	−0.57***	0.63***	–

*** $p < 0.001$.

2.2. Results

Descriptive statistics and correlations between political orientation and the two environmental dependent variables, across all participants, are presented in Table 1.

In these zero-order analyses, a conservative political orientation was strongly predictive of lower conservation intentions and lower climate change composite scores. Our main prediction was that the effect of political ideology on each environmental attitude would be moderated by the moral framing of the pro-environmental message, and particularly, that the binding moral frame would cause conservative participants to express greater pro-environmental attitudes. To examine this hypothesis, we conducted a single multiple regression for each environmental attitude. Conservation intentions, and then climate change composite scores, were each regressed onto political orientation (standardized), condition dummy code 1 (d1) (individualizing condition = 1; binding condition = 0; control condition = 0), condition dummy code 2 (d2) (individualizing condition = 0; binding condition = 0; control condition = 1), the political orientation × d1 interaction (calculated as the product of political orientation (standardized) and d1), and the political orientation × d2 interaction (calculated as the product of political orientation (standardized) and d2). By selecting the binding condition as the reference group in this dummy coding scheme, we were able to test the specific moderation hypotheses described earlier, in which we could examine if there was an increase in pro-environmental attitudes among conservatives in the binding condition relative to the individualizing condition (d1), and relative to the control condition (d2).

2.2.1. Conservation intentions

Results from the model predicting conservation intentions revealed the expected interactions, depicted in Fig. 1. There was a significant interaction between political orientation and d1, $b = -0.62$, $SE = 0.15$, $t(184) = -4.14$, $p < 0.001$, indicating that the effect of political orientation on conservation intentions was stronger in the individualizing condition than in the binding condition. Additionally, there was a significant interaction between political orientation and d2, $b = -0.42$, $SE = 0.14$, $t(184) = -3.05$, $p = 0.003$, indicating that the effect of political orientation on conservation intentions was also stronger in the control condition than in the binding condition.

Simple slopes analyses conducted within condition indicated that liberals (−1 *SD* on political orientation) had higher levels of conservation intentions than did conservatives (+1 *SD* on political orientation)

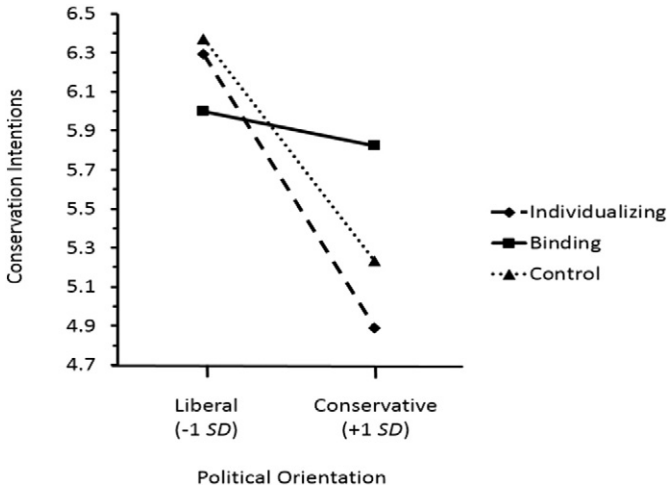

Fig. 1. Effects of political orientation and experimental condition on conservation intentions (Experiment 1). Values for conservation intentions are represented on the original 1 *extremely unlikely* to 7 *extremely likely* scale for that variable. Conservation intentions scores are estimated from specified regression models, in the specified conditions, at one standard deviation above and below the mean on political orientation.

among participants receiving the individualizing frame, $b = -0.70$, $p < 0.001$, and among control participants, $b = -0.51$, $p < 0.001$. There were no differences between liberals and conservatives who received the binding frame, $b = -0.09$, $p = 0.420$.

Simple slopes analyses conducted within political orientation indicated that liberals (−1 *SD* on political orientation) in the individualizing condition were no different in conservation intentions than liberals in the binding condition, $b = 0.30$, $p = 0.142$, and that liberals displayed marginally greater conservation intentions in the control than in the binding condition, $b = 0.38$, $p = 0.052$. Conservatives (+1 *SD* on political orientation) were higher in conservation intentions in the binding condition than in the individualizing condition, $b = -0.93$, $p < 0.001$, and the control condition, $b = -0.46$, $p = 0.026$.

2.2.2. Climate change composite

Results from the model predicting climate change composite scores also revealed the expected interactions, depicted in Fig. 2. There was a significant interaction between political orientation and d1, $b = -0.47$, $SE = 0.11$, $t(180) = -4.49$, $p < 0.001$, indicating that the effect of political orientation on climate change composite was stronger in the individualizing condition than in the binding condition. Additionally, there was a significant interaction between political orientation and d2, $b = -0.36$, $SE = 0.10$, $t(180) = -3.64$, $p < 0.001$, indicating that the effect of political orientation on conservation intentions was also stronger in the control condition than in the binding condition.

Simple slopes analyses conducted within condition indicated that liberals (−1 *SD* on political orientation) had higher levels of climate change composite than did conservatives (+1 *SD* on political orientation) in both the individualizing condition, $b = -0.57$, $p < 0.001$, and the control condition, $b = -0.46$, $p < 0.001$. There were no differences between liberals and conservatives in the binding condition, $b = -0.10$, $p = 0.147$.

Simple slopes analyses conducted within political orientation indicated that liberals (−1 *SD* on political orientation) in the binding condition were no different in climate change composite than liberals in the control condition, $b = 0.18$, $p = 0.203$, or the individualizing condition, $b = 0.21$, $p = 0.137$. Conservatives (+1 *SD* on political orientation) were higher in climate change composite in the binding condition than in the individualizing condition, $b = -0.73$, $p < 0.001$, and the control condition, $b = -0.54$, $p < 0.001$.

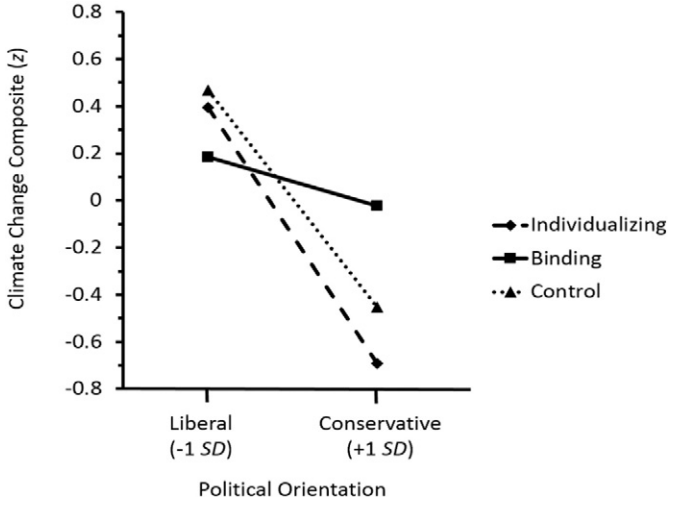

Fig. 2. Effects of political orientation and experimental condition on climate change composite scores (Experiment 1). Values for climate change composite are represented in standard (*z*) scores. Climate change composite scores are estimated from specified regression models, in the specified conditions, at one standard deviation above and below the mean on political orientation.

2.3. Discussion

Findings from Experiment 1 supported our prediction that the effects of political orientation on conservation intentions and climate change attitudes would be moderated by the moral framing of environmental concern. While the prototypical political polarity in environmental attitudes was observed in the individualizing and control conditions, participants across the political spectrum had relatively strong and statistically equivalent pro-environmental attitudes in the binding condition. In Experiment 2, we sought to replicate these findings with a different sample and an additional behavioral measure, and to assess perceptions of the identity and values of the message source in our test of mediated moderation.

3. Experiment 2

3.1. Method

3.1.1. Participants

A total of 187 participants, sampled from Amazon MTurk, completed a short 10–15 minute survey in exchange for $1.00. Participants were slightly older than the sample in Study 1 ($M = 36.27$, $SD = 10.43$). More females responded (53.5%) than males (46.5%).

3.1.2. Materials and procedure

Participants completed an anonymous on-line survey about their "personal values and behaviors" containing all of the same items that were assessed in Experiment 1. Following random assignment to either the individualizing, binding, or control condition, participants responded to the measures of conservation intentions and climate change attitudes. *Conservation intentions* and *climate change composite* scores were computed as before. In addition, to assess perceptions of the message source, participants in the individualizing and binding conditions were asked to indicate their level of agreement with the following two attitude statements immediately after reading the experimental instructions (public service message) detailed in the description of Experiment 1: "The message above reflects my group's values" and "The message above feels like it came from "my people". Participants responded on a scale ranging from 1 *strongly disagree* to 7 *strongly agree*. Across participants, responses to these items were highly correlated, $r(119) = 0.84$, $p < 0.001$, and the mean of responses to these two statements constituted each participant's *ingroup identity* score. Also, following the conservation intentions items, participants were asked: "Are you willing to donate a portion of your payment for taking this survey to the Environmental Defense Fund, an environmental organization dedicated to protecting the natural environment? What percentage of your payment are you willing to donate?" Participants were asked to indicate the percentage, from zero (none of it) to 100% (all of it) in increments of 10%. Participants received a *donation* score for this item, and were informed that donations to the Environmental Defense Fund would be made anonymously on their behalf in the amount specified.

3.2. Results

Descriptive statistics and correlations between political orientation and the three environmental dependent variables, across all participants, are presented in Table 2. As in Experiment 1, individuals who reported a more conservative political orientation expressed weaker conservation intentions and had lower climate change composite scores. Political orientation was not significantly associated with donations to the Environmental Defense Fund in these zero-order analyses. To examine our main prediction about the moderating effect of moral framing on the relationship between political orientation and environmental attitudes and behavior, each DV (conservation intentions, climate change composite, and donation) was regressed, in turn, onto the same set of predictors as in Experiment 1: political orientation

Table 2
Descriptive statistics and correlations between political orientation and environmental dependent variables (Experiment 2).

	M	*SD*	Political orientation	Conservation intentions	Climate change composite	Donations
Political orientation	3.29	1.10	–			
Conservation intentions	5.44	0.89	−0.40***	–		
Climate change composite	0.00	0.76	−0.58***	0.61***	–	
Donations	22.46	22.01	0.08	0.21**	0.27***	–

** $p < 0.01$.
*** $p < 0.001$

(standardized), condition dummy code 1 (d1) (individualizing condition = 1; binding condition = 0; control condition = 0), condition dummy code 2 (d2) (individualizing condition = 0; binding condition = 0; control condition = 1), the political orientation × d1 interaction (calculated as the product of political orientation (standardized) and d1), and the political orientation × d2 interaction (calculated as the product of political orientation (standardized) and d2). Following the description of these analyses, we separately present the tests of mediated moderation for all three dependent variables in the individualizing and binding conditions.

3.2.1. Conservation intentions

Results from the model predicting conservation intentions revealed the expected interactions, depicted in Fig. 3. There was a significant interaction between political orientation and d1, $b = -0.46$, $SE = 0.20$, $t(181) = -2.24$, $p = 0.026$, indicating that the effect of political orientation on conservation intentions was stronger in the individualizing condition than in the binding condition. Additionally, there was a significant interaction between political orientation and d2, $b = -0.54$, $SE = 0.17$, $t(181) = -3.24$, $p = 0.001$, indicating that the effect of political orientation on conservation intentions was also stronger in the control condition than in the binding condition.

Simple slopes analyses conducted within condition indicated that liberals (−1 *SD* on political orientation) had higher levels of conservation intentions than did conservatives (+1 *SD* on political orientation) in the individualizing condition, $b = -0.40$, $p = 0.003$, and in the control condition, $b = -0.47$, $p < 0.001$. There were no differences between liberals and conservatives in the binding condition, $b = 0.01$, $p = 0.950$.

Simple slopes analyses conducted within political orientation indicated that liberals (−1 *SD* on political orientation) in the binding condition were no different in conservation intentions than liberals in the individualizing condition, $b = 0.37$, $p = 0.114$, but were lower in the binding than in the control condition, $b = 0.47$, $p = 0.028$. Conservatives (+1 *SD* on political orientation) were higher in conservation intentions in the binding condition than in the control condition, $b = -0.50$, $p = 0.019$, and higher in the binding condition relative to the individualizing condition, $b = -0.45$, $p = 0.041$.

3.2.2. Climate change composite

Results from the model predicting climate change composite scores again revealed the predicted interactions, depicted in Fig. 4. There was a significant interaction between political orientation and d1, $b = -0.40$, $SE = 0.14$, $t(181) = -2.96$, $p = 0.004$, indicating that the effect of political orientation on climate change composite was stronger in the individualizing condition than in the binding condition. Additionally, there was a significant interaction between political orientation and d2, $b = -0.42$, $SE = 0.11$, $t(181) = -3.81$, $p < 0.001$, indicating that the effect of political orientation on climate change composite was also stronger in the control condition than in the binding condition.

Simple slopes tests within condition indicated that liberals (−1 *SD* on political orientation) had higher levels of climate composite than did conservatives (+1 *SD* on political orientation) in the individualizing condition, $b = -0.55$, $p < 0.001$, and in the control condition, $b = -0.54$, $p < 0.001$. There were no differences between liberals and conservatives in the binding condition, $b = -0.12$, $p = 0.223$.

Simple slopes analyzed within political orientation indicated that liberals (−1 *SD* on political orientation) in the individualizing condition were no different in climate composite than liberals in the binding condition, $b = 0.18$, $p = 0.292$. Liberals in the binding condition did score lower that liberals in the control condition, $b = 0.34$, $p = 0.028$. Conservatives (+1 *SD* on political orientation) were higher in climate composite in the binding condition than in the individualizing condition, $b = -0.62$, $p < 0.001$, and the control condition, $b = -0.49$, $p = 0.002$.

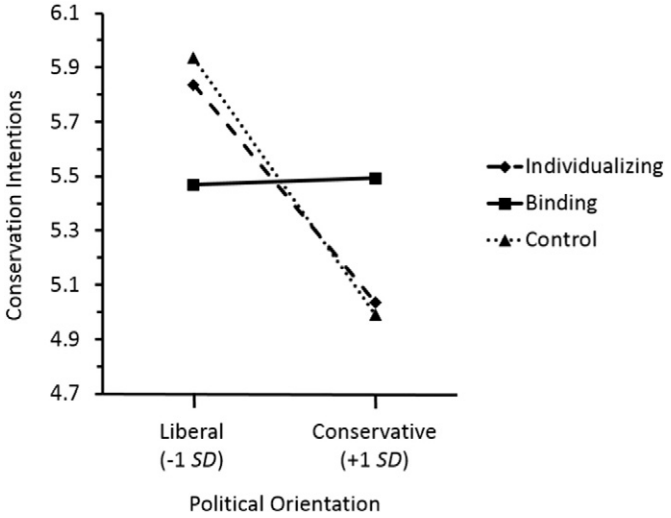

Fig. 3. Effects of political orientation and experimental condition on conservation intentions (Experiment 2). Values for conservation intentions are represented on the original 1 *extremely unlikely* to 7 *extremely likely* scale for that variable. Conservation intentions scores are estimated from specified regression models, in the specified conditions, at one standard deviation above and below the mean on political orientation.

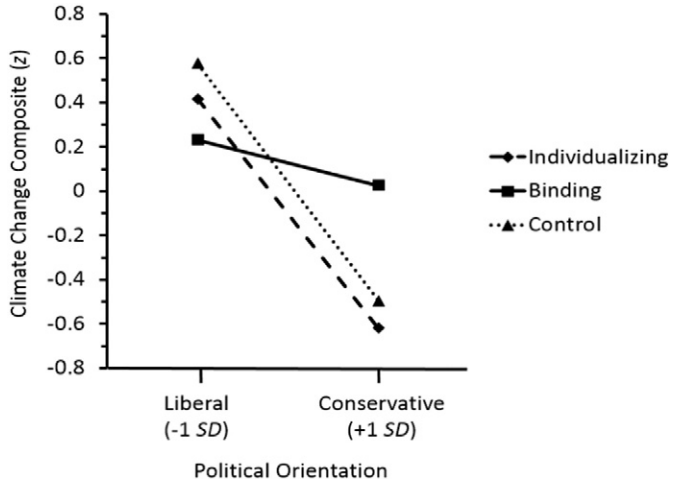

Fig. 4. Effects of political orientation and experimental condition on climate change composite scores (Experiment 2). Values for climate change composite are represented in standard (*z*) scores. Climate change composite scores are estimated from specified regression models, in the specified conditions, at one standard deviation above and below the mean on political orientation.

3.2.3. Environmental Defense Fund donations

Results from the model predicting donations again displayed evidence for the moderating effects of moral frame on the relationship between political orientation and environmental behavior. The interactions are depicted in Fig. 5. There was a significant interaction between political orientation and d1, $b = -1.46$, $SE = 0.49$, $t(181) = -2.97$, $p = 0.003$, indicating that the effect of political orientation on donations was stronger in the binding condition than in the individualizing condition. Additionally, there was a significant interaction between political orientation and d2, $b = -1.10$, $SE = 0.40$, $t(181) = -2.77$, $p = 0.006$, indicating that the effect of political orientation on donations was also stronger in the binding condition than in the control condition.

Simple slopes tests within condition indicated that in the binding condition, liberals (−1 *SD* on political orientation) had *lower* levels of donations than did conservatives (+1 *SD* on political orientation), $b = 1.09$, $p = 0.001$. There were no differences between liberals and conservatives in the individualizing condition, $b = -0.37$, $p = 0.302$, or in the control condition, $b = -0.01$, $p = 0.960$.

Simple slopes examined within political orientation indicated that liberals (−1 *SD* on political orientation) in the binding condition were marginally lower in donations than liberals in the individualizing condition, $b = 1.15$, $p = 0.066$, and the control condition, $b = 1.04$, $p = 0.064$. Conservatives (+1 *SD* on political orientation) were higher in donations in the binding condition than in the individualizing condition, $b = -1.76$, $p = 0.006$, and the control condition, $b = -1.15$, $p = 0.042$.

3.2.4. Mediated moderation

Finally, tests of mediated moderation were conducted in order to determine if the observed moderating effects of moral framing condition (individualizing vs. binding) on the relationship between political orientation and environmental attitudes were mediated by the perceived ingroup identity of the message source. To do so, we utilized Hayes (2013, 2016) *PROCESS* bootstrapping macro with 10,000 iterations to test the indirect effect of the political orientation by moral framing condition interaction on each environmental dependent variable. In these models, political orientation was again standardized, condition was contrast-coded (individualizing = −1; binding = 1), and the interaction was calculated as the product of these two terms. Below, we report the total, direct, and indirect effects of the political orientation by condition interaction on each DV.

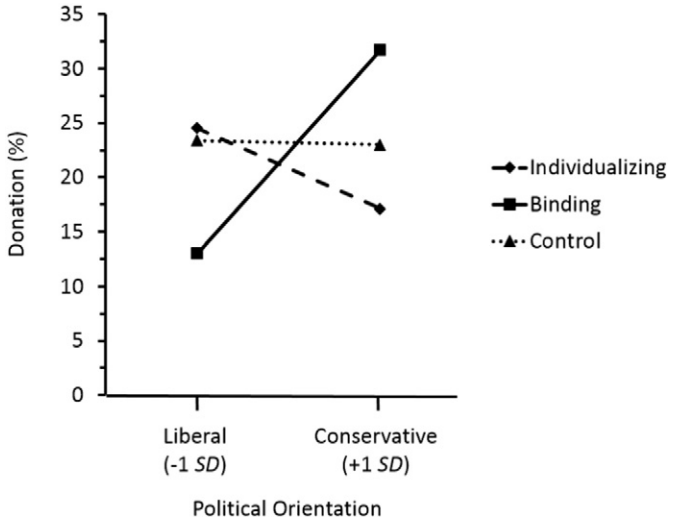

Fig. 5. Effects of political orientation and experimental condition on donations to the Environmental Defense Fund (Experiment 2). Values for donations are represented in percentages of payment for participation. Donation scores are estimated from specified regression models, in the specified conditions, at one standard deviation above and below the mean on political orientation.

In the analysis predicting conservation intentions, the interaction's effect in the simple moderation model (Total effect: $b = 0.21$, $SE = 0.08$, $t = 2.40$, $p = 0.018$) was reduced after including ingroup identity in the model (Direct effect: $b = 0.13$, $SE = 0.09$, $t = 1.46$, $p = 0.146$). The interaction's indirect effect was significant ($b = 0.08$, $SE = 0.04$, 95% CI [0.02, 0.18]). Because zero was not in the 95% confidence interval, the indirect effect of the interaction on conservation intentions via ingroup identity was significantly different from zero at $p < 0.05$, thus establishing mediated moderation.

In the analysis predicting climate change composite, the interaction's effect in the simple moderation model (Total effect: $b = 0.20$, $SE = 0.06$, $t = 3.19$, $p = 0.002$) was reduced after including ingroup identity in the model (Direct effect: $b = 0.14$, $SE = 0.06$, $t = 2.16$, $p = 0.033$). The interaction's indirect effect was significant ($b = 0.06$, $SE = 0.03$, 95% CI [0.02, 0.13]), establishing mediated moderation.

In the analysis predicting donations, the interaction's effect in the simple moderation model (Total effect: $b = 0.73$, $SE = 0.21$, $t = 3.40$, $p < 0.001$) was again reduced after including ingroup identity in the model (Direct effect: $b = 0.57$, $SE = 0.22$, $t = 2.56$, $p = 0.012$). The interaction's indirect effect was significant ($b = 0.16$, $SE = 0.08$, 95% CI [0.05, 0.36]), establishing mediated moderation.

3.3. Discussion

Findings from Experiment 2 replicated the moderating effects of moral framing on the relationship between political orientation and environmental attitudes. This experiment also demonstrated significant moderating effects on actual behavior, in the form of donations to the Environmental Defense Fund. Additionally, the perception that the message about environmental concern came from an ingroup member who shared one's values was shown to mediate these effects. In our last experiment, we sought to replicate the basic moral framing effects one additional time and to then examine the role of perceived message strength. Because findings in the control condition had tended to mirror those in the individualizing condition, and because we wanted to focus on the perceived message strength of the moral frames, Experiment 3 only administered the individualizing and binding conditions.

4. Experiment 3

4.1. Method

4.1.1. Participants

A total of 97 participants, sampled from Amazon MTurk, completed a short 10–15 minute survey in exchange for $1.00. Participants were comparably aged to those sampled in Experiments 1 and 2 ($M = 32.08$, $SD = 9.17$). More males responded (55.6%) than females (44.4%).

4.1.2. Materials and procedure

Participants completed an anonymous on-line survey about their "personal values and behaviors." Following random assignment to either the individualizing or the binding condition, respondents completed all of the same environmental attitude and behavior items that were assessed in Experiment 2. Scores for *conservation intentions*, *climate change composite*, and *donation* were computed as before. In addition, to assess the perceived strength of the pro-environmental message, participants completed a 9-item measure of perceived argument strength immediately following exposure to each moral framing message (Zhao, Strasser, Cappella, Lerman, & Fishbein, 2011). Zhao et al. (2011) demonstrated that this measure correlates strongly with more traditional open-ended assessments of argument strength (e.g. higher numbers of positive relative to negative thoughts listed about targeted messages). Responses to scale items were reported on two separate 7-point scales (1 *strongly disagree* to 7 *strongly agree*, and 1 *very weak* to 7 *very strong*) and a *perceived message strength* score was calculated for each participant as detailed by Zhao et al. (2011), with higher

numbers reflecting perceptions that the message was more believable, convincing, and gave stronger reasons for engaging in environmental conservation. Additionally, following the measure of perceived message strength, and before the assessments of environmental attitudes and behavior, participants responded to a single item asking them to identify the person "who you think wrote the statement above, in terms of their political orientation." Responses were provided on a 7-point scale, ranging from 1 *a very liberal person* to 7 *a very conservative person*. Participants' response on this single item constituted their *perceived message source* score, with higher numbers reflecting the perception that the message came from a more conservative source.

4.2. Results

In the analysis for this experiment, we first sought to replicate the basic moderating effects of moral frame on the relationship between political attitudes and environmental attitudes and behavior, as in Experiments 1 and 2. Following, we examined the role of perceived message strength in explaining these effects; first by testing for condition and individual differences in the perceived strength of the message, and second, by examining the role of perceived strength in predicting variation in environmental attitudes and behavior. Descriptive statistics and correlations between political orientation, the three environmental dependent variables, perceived message strength, and perceived message source, across all participants, are presented in Table 3.

4.2.1. Environmental attitudes and behaviors

As in Experiment 2, across all participants, individuals who reported a more conservative political orientation expressed weaker conservation intentions and had lower climate change composite scores. Political orientation was again not significantly associated with donations to the Environmental Defense Fund. To examine our main prediction about the moderating effect of moral framing on the relationships between political orientation and environmental attitudes and behavior, each DV was regressed onto political orientation (standardized), moral framing condition (contrast-coded as −1 for individualizing and +1 for binding), and the interaction between political orientation and moral framing condition (calculated as the product of political orientation (standardized) and moral framing condition).

4.2.1.1. Conservation intentions. The model predicting conservation intentions revealed the significant interaction between political orientation and condition, $b = 0.24$, $SE = 0.08$, $t(95) = 2.71$, $p = 0.008$. This interaction is depicted in Fig. 6 and indicates that the effect of political orientation on conservation intentions was stronger in the individualizing condition than in the binding condition. Simple slopes analyses conducted within condition indicated that liberals (−1 *SD* on political orientation) had higher levels of conservation intentions than did conservatives (+1 *SD* on political orientation) in the individualizing condition, $b = -0.49$, $p < 0.001$. There were no differences between liberals and conservatives in the binding condition, $b = -0.05$, $p = 0.670$.

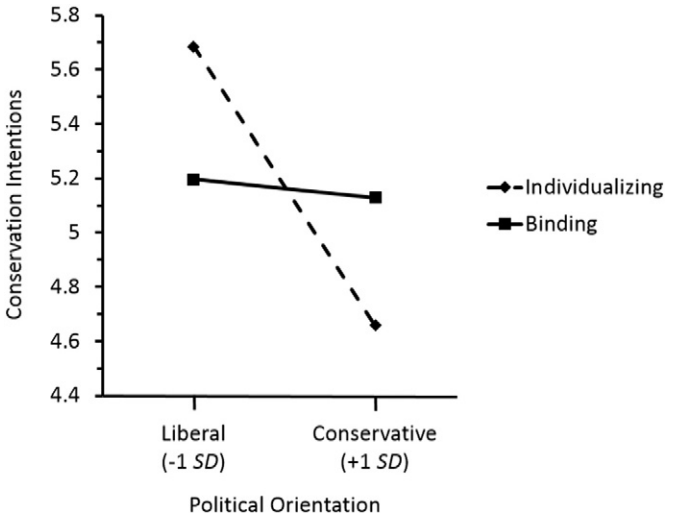

Fig. 6. Effects of political orientation and experimental condition on conservation intentions (Experiment 3). Values for conservation intentions are represented on the original 1 *extremely unlikely* to 7 *extremely likely* scale for that variable. Conservation intentions scores are estimated from specified regression models, in the specified conditions, at one standard deviation above and below the mean on political orientation.

Simple slopes analyses conducted within political orientation indicated that liberals (−1 *SD* on political orientation) in the binding condition were significantly lower in conservation intentions than liberals in the individualizing condition, $b = -0.24$, $p = 0.050$. Conservatives (+1 *SD* on political orientation) were higher in conservation intentions in the binding condition than in the individualizing condition, $b = 0.22$, $p = 0.048$.

4.2.2. Climate change composite

The model predicting climate change composite scores also revealed a significant interaction between political orientation and condition, $b = 0.17$, $SE = 0.05$, $t(95) = 3.09$, $p = 0.001$. This interaction is depicted in Fig. 7 and indicates that the effect of political orientation on climate change composite was stronger in the individualizing condition than in the binding condition. Simple slopes tests within condition indicated that liberals (−1 *SD* on political orientation) had higher levels of climate composite than did conservatives (+1 *SD* on political orientation) in the individualizing condition, $b = -0.51$, $p < 0.001$, as well as in the binding condition, $b = -0.17$, $p = 0.036$. Simple slopes analyzed within political orientation indicated that liberals (−1 *SD* on political orientation) in the individualizing condition were greater in climate composite than liberals in the binding condition, $b = -0.21$, $p = 0.009$. Conservatives (+1 *SD* on political orientation) were higher in climate composite in the binding condition than in the individualizing condition, $b = 0.17$, $p = 0.033$.

Table 3
Descriptive statistics and correlations between political orientation, environmental dependent variables, and perceptions of message strength and source (Experiment 3).

	M	*SD*	Political orientation	Conservation intentions	Climate change composite	Donations	Perceived message strength	Perceived message source
Political orientation	3.13	1.33	–					
Conservation intentions	5.25	0.89	−0.37***	–				
Climate change composite	0.00	0.65	−0.57***	0.62***	–			
Donations	14.23	23.06	0.03	0.29**	0.22**	–		
Perceived message strength	4.71	1.30	0.06	0.34**	0.26*	0.29**	–	
Perceived message source	4.27	1.96	0.26*	−0.01	−0.09	0.14	−0.33**	–

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

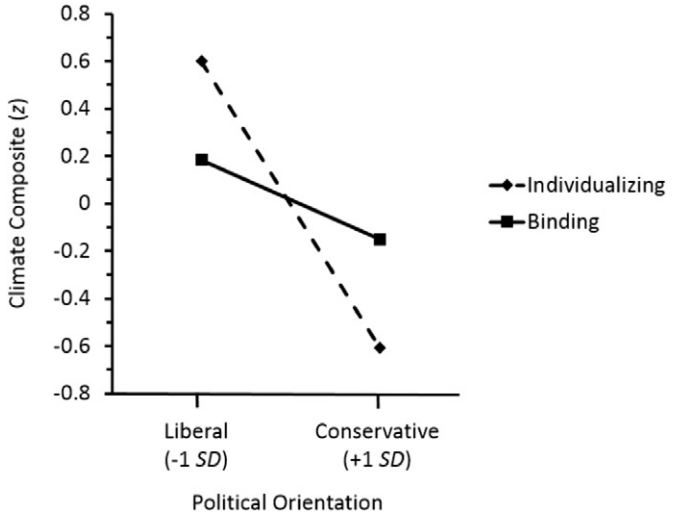

Fig. 7. Effects of political orientation and experimental condition on climate change composite scores (Experiment 3). Values for climate change composite are represented in standard (z) scores. Climate change composite scores are estimated from specified regression models, in the specified conditions, at one standard deviation above and below the mean on political orientation.

4.2.3. Environmental Defense Fund donations

There was a significant interaction between political orientation and condition, $b = 0.58$, $SE = 0.28$, $t(95) = 2.40$, $p = 0.018$. This interaction is depicted in Fig. 8, and indicates that the effect of political orientation on donations was nearly the opposite in the individualizing condition as in the binding condition. Simple slopes tests indicated that in the binding condition, liberals (-1 *SD* on political orientation) had *lower* levels of donations than did conservatives ($+1$ *SD* on political orientation), $b = 0.76$, $p = 0.044$. There were no differences between liberals and conservatives in the individualizing condition, $b = -0.40$, $p = 0.192$. Simple slopes examined within political orientation indicated that liberals (-1 *SD* on political orientation) in the individualizing condition were not significantly different in donations than liberals in the binding condition, $b = -0.54$, $p = 0.121$. On the other hand, conservatives ($+1$ *SD* on political orientation) were marginally higher in donations in the binding condition than in the individualizing condition, $b = 0.62$, $p = 0.060$.

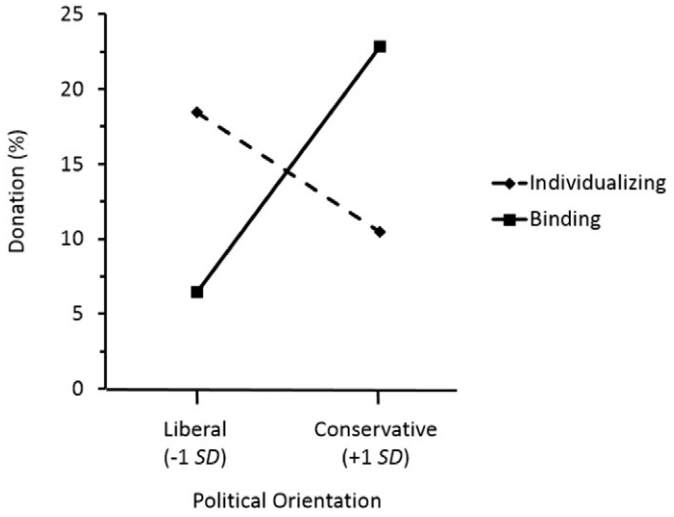

Fig. 8. Effects of political orientation and experimental condition on donations to the Environmental Defense Fund (Experiment 3). Donation values are represented in percentages of one dollar. Donations are estimated from specified regression models, in the specified conditions, at one standard deviation above and below the mean on political orientation.

4.2.4. Perceived message strength and source

To examine if perceived message strength and perceived message source were different as a function of condition and political orientation, we regressed each variable, in turn, on political orientation (standardized), moral framing condition (contrast coded as -1 for individualizing and $+1$ for binding), and the political orientation (standardized) $\times$ moral framing condition interaction.

Results from the model predicting perceived message strength revealed a significant main effect of condition, $b = -0.58$, $t(95) = -5.35$, $p < 0.001$, indicating that the binding argument was perceived as significantly weaker than the individualizing argument. There was also a significant interaction, indicating that assessments of strength were different for liberals and conservatives between the two conditions, $b = 0.51$, $t(95) = 4.55$, $p < 0.001$. Simple effects within condition indicated that conservatives ($+1$ *SD* on political orientation) rated the binding message as stronger than did liberals (-1 *SD* on political orientation), $b = 0.70$, $p < 0.001$, and the individualizing message as weaker than did liberals, $b = -0.31$, $p = 0.022$. Liberals perceived the individualizing message as much stronger than the binding message, $b = -1.09$, $p < 0.001$, and conservatives perceived the messages as equivalently strong, $b = -0.08$, $p = 0.61$.

Results from the model predicting perceived message source revealed a significant main effect of condition, $b = 1.11$, $t(95) = 7.40$, $p < 0.001$, indicating that the message source was perceived as significantly more conservative in the binding condition than in the individualizing condition. There was also a significant interaction, indicating that assessments of message source were different for liberals and conservatives between conditions, $b = -0.63$, $t(95) = -4.08$, $p < 0.001$. Simple effects indicated that liberals (-1 *SD* on political orientation), $b = 1.74$, $p < 0.001$, and conservatives ($+1$ *SD* on political orientation), $b = 0.49$, $p = 0.025$, both perceived the source as more conservative in the binding condition. In the individualizing condition, liberals rated the message source as substantially more liberal than conservatives, $b = 0.89$, $p < 0.001$, whereas the source was perceived by liberals and conservatives as equally conservative in the binding condition, $b = -0.36$, $p = 0.139$.

Next, we examined the extent to which variations in perceived message strength could be explained by perceptions of the message source, political orientation, and moral framing condition. To do so, a hierarchical regression was conducted in which perceived message strength was regressed onto: (Step 1) political orientation (standardized), moral framing condition (contrast coded as -1 for individualizing vs. $+1$ for binding), and perceived message source (standardized); (Step 2) the predictors from Step 1 and all two-way interactions (political orientation (standardized) $\times$ moral framing condition, political orientation (standardized) $\times$ perceived message source (standardized), and moral framing condition $\times$ perceived message source (standardized)); and (Step 3) the predictors from Step 2 and the political orientation (standardized) $\times$ moral framing condition $\times$ perceived message source (standardized) three-way interaction. The results from this analysis are presented in Table 4.

In Step 1, the significant main effect of moral framing indicated that the individualizing message was perceived as stronger than the binding message. On average, perceptions of the binding message were just above the scale midpoint ($M = 4.16$, $SD = 1.37$), while perceptions of the individualizing message were approximately 1 scale point in the stronger direction ($M = 5.28$, $SD = 0.94$).

In Step 2, the moral framing condition $\times$ perceived message source interaction and the political orientation $\times$ perceived message source interaction were both significant. The moral framing condition $\times$ perceived message source interaction reflected the tendency for the condition difference in perceived message strength (with individualizing stronger than binding) to be more pronounced when the message was perceived to come from a more conservative source. The political orientation $\times$ perceived message source interaction reflected the tendency for messages to be perceived as stronger when there

Table 4
Hierarchical regression predicting perceived message strength with political orientation, moral framing condition, and perceived message source.

	Step 1			Step 2			Step 3		
	b	*SE*	*t*	*b*	*SE*	*t*	*B*	*SE*	*t*
Constant	4.72	0.12	39.38***	4.87	0.13	37.60***	5.00	0.15	32.38***
Political orientation	0.14	0.13	1.09	−0.02	0.12	−0.16	−0.21	0.17	−0.22
Moral framing condition	−0.44	0.16	−2.86**	−0.35	0.15	−2.26*	−0.39	0.16	−2.50*
Perceived message source	−0.20	0.16	−1.22	−0.12	0.15	−0.80	−0.11	0.15	−0.70
Political orientation × moral framing condition				0.27	0.16	1.81†	0.21	0.15	1.35
Political orientation × perceived message source				0.45	0.15	3.10**	0.50	0.15	3.38**
Moral framing condition × perceived message source				−0.45	0.14	−3.28**	−0.55	0.15	−3.64***
Political orientation × moral framing condition × perceived message source							0.27	0.16	1.73†
R^2	0.20***			0.47***			0.48***		
ΔR^2	0.20***			0.26***			0.02†		

† $p < 0.10$.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

was a "match" between the political orientation of the perceived message source and the perceiver: when conservatives saw the message as coming from a conservative source and when liberals saw it as coming from a liberal source. The three-way interaction included in Step 3 of the analysis did not significantly predict additional variation in perceived message strength.

Next, we examined the relationship perceived message strength and environmental attitudes and behavior. As indicated in Table 3, participants who perceived the message as being stronger had greater conservation intentions, greater climate change composite scores, and higher donations. We examined the extent to which the influence of message strength would depend on political orientation and moral framing condition, and, also, whether the moderating effects of moral framing on the relationship between political orientation and environmental attitudes and behavior would persist when perceived message strength was included as an explanatory variable. Given the consistent relationships between perceived message strength and the environmental dependent variables, for the sake of parsimony, we first computed a single composite index of *environmentalism* for each participant, calculated as the mean of the conservation intentions score (standardized), the climate change composite score (standardized), and the donation score (standardized). Higher numbers on this environmentalism index indicated greater pro-environmental attitudes and behavior.

To address our research questions about the explanatory value of perceived message strength, we conducted a hierarchical regression in which environmentalism was regressed onto: (Step 1) political orientation (standardized), moral framing condition (contrast-coded as −1 for individualizing and +1 for binding), and perceived message strength (standardized); (Step 2) the predictors from Step 1 and all two-way interactions (political orientation (standardized) × moral framing condition, political orientation (standardized) × perceived message strength (standardized), and moral framing condition × perceived message strength (standardized)); and (Step 3) the predictors from Step 2 and the political orientation (standardized) × moral framing condition × perceived message strength (standardized) three-way interaction. The results from this analysis are presented in Table 5.

In Step 1, the significant main effects of all three predictors indicated that environmentalism was higher among liberals, among participants in the binding condition, and among those who perceived the message as stronger. In Step 2, these effects were qualified by a significant political orientation × moral framing condition interaction and a significant political orientation × perceived message strength interaction. In Step 3, the political orientation × perceived message strength interaction was no longer significant, and there was instead a significant three-way interaction, which we present in Fig. 9 to facilitate interpretation.

In Fig. 9, it is apparent that in three of the groups depicted (binding condition, weaker message; individualizing condition, stronger message; individualizing condition, weaker message), we see the clear main effect of political orientation that persists in the Step 3 model, as evidenced by the consistent negative slope. The notable exception to this trend is in the binding condition, when the message is perceived as strong — in this case environmentalism is quite high among more conservative respondents. Another way of approaching the interpretation of this interaction is to observe that the moderating effect of condition (on the political orientation–environmentalism relationship) observed in this experiment is accentuated when the binding message is perceived as strong by conservatives. Given the relatively small sample size and the presence of significant interrelationships between variables that were included in the Step 3 model (e.g., the main effect of moral framing condition on perceived message strength, described

Table 5
Hierarchical regression predicting environmentalism with political orientation, moral framing condition, and perceived argument strength.

	Step 1			Step 2			Step 3		
	b	*SE*	*T*	*B*	*SE*	*t*	*b*	*SE*	*t*
Constant	0.11	0.07	1.53	0.16	0.08	1.97†	0.02	0.09	0.19
Political orientation	−0.29	0.07	−4.07***	−0.30	0.08	−3.80***	−0.16	0.09	−1.89†
Moral framing condition	0.25	0.08	3.20**	0.10	0.09	1.12	0.17	0.09	1.98†
Perceived message strength	0.45	0.08	5.66***	0.29	0.09	3.22**	0.44	0.10	4.47***
Political orientation × moral framing condition				0.31	0.09	3.64***	0.22	0.09	2.47*
Political orientation × perceived message strength				0.21	0.10	2.16*	0.13	0.10	1.37
Moral framing condition × perceived message strength				0.15	0.10	1.51	0.06	0.10	0.62
Political orientation × moral framing condition × perceived message strength							0.30	0.10	3.12**
R^2	0.33***			0.42***			0.48***		
ΔR^2	0.33***			0.09**			0.06**		

† $p < 0.10$.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

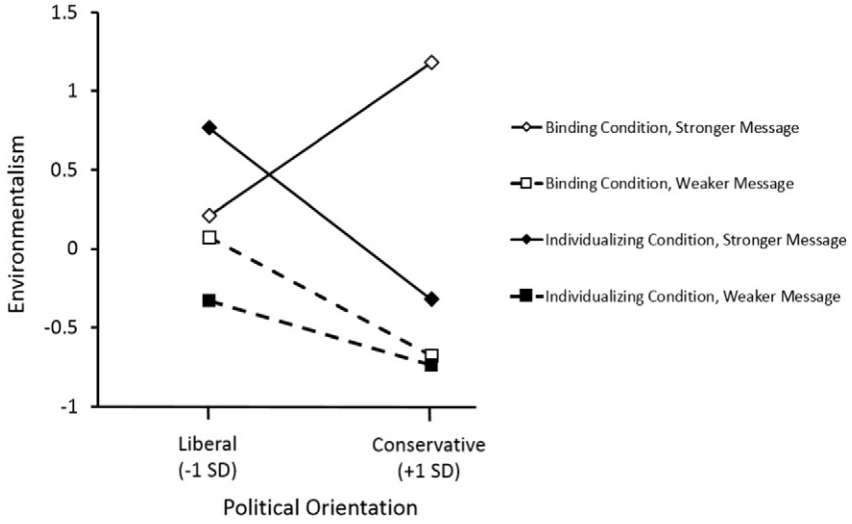

Fig. 9. Effects of political orientation, moral framing condition, and perceived message source on perceived message strength (Experiment 3). Values for political orientation are +1 *SD* for conservative and −1 *SD* for liberal. Values for perceived message strength are +1 *SD* for a strong argument and −1 *SD* for a weaker argument.

above), the stability of the three-way interaction should be interpreted with a degree of caution. Importantly though, relevant diagnostics did not reveal any obvious cause for concern with multicollinearity. All tolerance values were greater than 0.50 and all variance inflation factor values were less than 2.3 for variables included in the Step 3 model.

5. General discussion

This investigation extends emerging work on the effects of moral framing on environmental attitudes and behaviors. To review, presenting a binding pro-environmental frame significantly moderated the effects of political orientation on conservation intentions, attitudes about climate change, and donations to an environmental organization. While liberals did not differ substantially across conditions, conservatives in the binding condition, relative to those in the individualizing and control conditions, reported more positive environmental attitudes and behaviors, frequently up to the level of liberals. These experiments suggest that general pro-environmental appeals that match the moral values of conservatives, as derived from Moral Foundations Theory, may have consistent positive effects across an array of environmental attitudes and behaviors.

Findings from Experiment 2 demonstrated that the observed moral framing effects were mediated by social identity — namely, by the extent to which perceivers felt that there was a match between the source of the pro-environmental message and their ingroup. This indicates that active concern for the natural environment may be facilitated by appealing to the self-expressive functions of attitudes, similar to Hillman's (2010) notion of expressive rationality, in which assertions of attitudes and associated behaviors are meant to affirm ingroup loyalty and values. In certain domains, such as in the accurate communication of scientific data, it may be appropriate to attempt to limit the influence of such social identity factors or other polarizing ideological motivations (see Kahan, 2013). But while communication of climate change and other scientific data to the public remains a laudable and essential goal, how individuals or subcultural constituencies *interpret* this information and how they choose to *act or not act* on the basis of it will always remain socially-motivated — a function of what is deemed important, moral, and identity-affirming. Because such motivations are so profoundly influential in human psychology, we argue that it is immensely important to promote inclusivity and tolerance of multiple moral and ideological frameworks, and to appeal to the functions of attitudes from multiple perspectives. This has clearly not been the case for the prevailing discourse on environmentalism (Nisbet et al., 2012).

Experiment 3 continued to replicate the predicted moderation effects and, by assessing perceived argument strength, provided insight into the manner in which differential evaluation of message quality occurs. On average, liberals saw the binding message as much weaker than the individualizing message, while conservatives saw them as equivalently strong. In both conditions, there was a tendency to rate messages as stronger when there was a "match" between the political orientation of the perceived message source and that of the perceiver: when conservatives saw the message as coming from a conservative source and when liberals saw it as coming from a liberal source. In turn, higher perceived message strength was predictive of greater environmentalism, and this was particularly true for conservatives in the binding condition. Thus, the moderating effect of moral framing condition (on the political orientation–environmentalism relationship) observed throughout these experiments appears to be stronger to the degree that the binding message is perceived as strong by conservatives, which is facilitated when the source is perceived as more conservative.

Future experiments that manipulate message source and message strength within the binding and individualizing frames are necessary to assess information processing issues and the relative effects of specific message characteristics on environmental attitudes. Classic ELM work by Petty and Wegener (1998) suggests that when messages are more relevant to the self – as in the case of a functional match – increased elaboration will cause perceivers to be more sensitive to strong vs. weak arguments in the process of persuasion. Work by Cohen (2003) and Nelson and Garst (2005) supports this finding in the political domain, indicating that political ingroup matching increases systematic processing (see also Mackie, Gastardo-Conaco, & Skelly, 1992). While we did not directly assess depth of processing in the present research, we did observe an interesting pattern of relationships between perceptions of message quality and environmentalism in Experiment 3: perceived message strength was predictive of conservatives' environmentalism in the binding condition (high relevance) but not in the individualizing condition (low relevance); and the opposite was true for liberals (see Fig. 9). While these findings are at least consistent with what we should expect if functional matching on moral foundations increases the likelihood of elaboration, explicit efforts to test core ELM information processing predictions remain for future work.

Experiments that evaluate the outcomes of constraining perceivers' abilities to engage in effortful processing (e.g. brief presentation under cognitively distracted circumstances) and of presenting limited peripheral moral cues (e.g. an image of an American flag in a natural scene) may offer realistic approximations of moral framing effects in pro-environmental public relations campaigns. Graham et al. (2009) suggest

that moral judgments are strongly driven by automatic processes, and findings such as those of Feygina et al. (2010) indicate that as little as two sentences pronouncing the patriotic significance of being pro-environmental can have substantial attitudinal and behavioral effects. Thus, it would interesting to determine the conditions under which limited cues and limited argument quality are sufficient to produce matching effects in the moral domain. Of course, more sustainable and internalized attitude change is likely to require far more systematic processing of coherent linkages between conservative values and environmental conservation.

In comparison with prior research on moral framing and environmentalism, we find that our effects were generally in line with those observed by Feinberg and Willer (2013), in which conservatives' pro-environmental attitudes increased in the morally-congruent appeal, while liberals' attitudes remained unchanged across conditions. In contrast, Kidwell et al. (2013) demonstrated consistently symmetrical "crossover" interactions in their analysis of individualizing vs. binding appeals. They found that relative to the absence of any political differences in a control condition, the binding condition increased pro-environmental behavioral intentions among conservatives but not liberals, and the individualizing condition increased pro-environmental behavioral intentions among liberals but not conservatives. This divergence from our findings, and from those of Feinberg and Willer (2013), could be attributable to the fact that the dependent variables used by Kidwell et al. (2013) were targeting quite specific behavioral intentions and behaviors (primarily recycling in a specific program), which we should expect to be predicted far more by a congruent and highly proximal appeal than by one's general environmental attitudes.

Interestingly, in Experiments 2 and 3, when we examined moral framing effects on a specific behavior – donations to the Environmental Defense Fund – our findings looked somewhat more similar to those of Kidwell et al. (2013), particularly driven by heightened donations by conservatives in the binding condition, well exceeding that of liberals. Although the actual magnitude of these donations was small, we see this as a provocative effect that may have substantial implications for shaping the fundraising operations of environmental and other organizations. Clearly, future work should examine the extent to which such economic behavior can be more radically shifted through the moral framing of persuasive appeals. We can only speculate on the considerable response by conservatives on this variable. It could be that our choice of organization, the Environmental *Defense* Fund, was particularly appealing and "on message" for conservatives when paired with the binding manipulation, resulting in substantial support. The lack of association between donations and political orientation in the control condition is analogous to that observed by Kidwell et al. (2013), and in retrospect, not terribly surprising, given that it is a very specific behavior.

Overall, when assessing more general environmental attitudes, results in the control condition looked very similar to those in the individualizing condition. This suggests that an individualizing morality (and associated liberal connotations) may be implicitly primed when people are generically reminded of concern for the natural environment, leading to a certain level of identity-mediated message rejection by conservatives. Consistent with this hypothesis, Gromet et al. (2013) found that, relative to no message at all, general pro-environmental messages may backfire and negatively impact the attitudes and behaviors of conservative individuals. Kahan, Braman, Cohen, Gastil, and Slovic (2010) also demonstrate how the simple presence of an argument can have a polarizing effect. We intended for our control condition to provide a brief generic pro-environmental appeal, and in retrospect, it may be that the single sentence we included ("Many people are concerned about the health of the natural environment") constituted a polarizing argument in many people's minds, and perhaps an individualizing one at that, given the mild semantic connection with the moral domain of harm/care. On the other hand, Feinberg and Willer's (2013) Study 3 included a true "no appeal" control condition, and they found political polarization on general environmental attitudes, very similar to that observed in their appeal to liberal morality. Thus, simply asking about a set of environmental issues may be so implicitly loaded with chronically accessible political and moral arguments that polarization is inevitable. It is likely that such division will only diminish in the wake of a more inclusive environmental discourse that chronically and systematically re-frames concern for the natural environment as a valid expression of individualizing *and* binding morality.

6. Conclusion

In summary, data from this investigation substantially broadens our understanding of the outcomes of and the psychological processes underlying moral framing effects on environmental attitudes and behaviors. Results demonstrated a wide array of effects on conservation intentions, climate change attitudes, and monetary donations. Moving forward, it would be worthwhile to isolate the particular message components that are most identity-affirming for environmental communications to different groups. In the present study, the "binding" message technically confounds respect for authority, loyalty, purity, and patriotism. It is possible that simply highlighting obedience to God or presenting an American flag in the context of nature-related imagery could be sufficient to shift the attitudes of certain conservative audiences.

While such narrowcasting may then serve as a useful mechanism for targeting persuasive environmental appeals to specific groups, the sustainability of a broad scale environmental movement may benefit to a greater degree from the development and implementation of moral frames that are inclusive of and engaging to a wide range of demographics, including across the political spectrum. Additionally, overly segmented communications tailored to specific audiences run the risk of further exacerbating divisiveness and animosity in public discourse on important policy issues. As Serazio (2014) argues on the acceleration of targeted political advertising: "A political media ecology in which citizens hear only what they expect to hear from those they want to deliver it is, by design, a system set against any sense of common culture and shared truths" (p. 759). Given the dire nature of scientific consensus on climate change and other global environmental problems, those pursuing a substantial transformation of human–environmental relationships can ill afford an increasingly fragmented populace.

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