

Nature for whom? How type of beneficiary influences the effectiveness of conservation outreach messages

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Funding sources: This work was supported by a National Science Foundation Doctoral Dissertation Research Improvement Grant [Award #1725530, 2017] and the National Science Foundation Long-Term Ecological Research Program at the H.J. Andrews Experimental Forest [DEB 1440409].

Conflict of Interest statement: The authors declare no conflict of interest in the preparation of this manuscript.

Abstract

In recent years the conservation community has engaged in debate over value in nonhuman nature, especially as it relates to motivations for conservation. Many have expressed the assumption that more people are willing to support conservation when emphasis is placed on the human benefits of nonhuman nature, rather than the value of nonhuman nature for its own sake. To test this assumption, we designed an online survey investigating how the type of beneficiary (human, nonhuman, or both) depicted in outreach messages affects two metrics of support: attitudes toward the message and donations for a conservation organization. Each respondent viewed one message highlighting humans, nonhumans, or both as conservation beneficiaries. Predicting that the effect of beneficiary type would depend partially on individual differences, we also measured respondents' moral inclusivity, i.e., the values and beliefs they hold with regard to human and various nonhuman entities. Although beneficiary type did not affect attitudes, we report several key findings for donation. Compared to messages depicting only nonhuman beneficiaries, messages depicting only human beneficiaries were associated with lower likelihood of donation overall and, among less morally inclusive respondents, lower donation amounts. At the same time, messages depicting both human and nonhuman beneficiaries were not associated with more positive donation outcomes than messages depicting only nonhuman beneficiaries. Our results suggest that highlighting humans as conservation beneficiaries may not most effectively generate social support for conservation. Messages advocating the protection of nonhuman nature for its own sake may produce the most consistently positive donation outcomes.

Keywords: intrinsic value, ecosystem services, elaboration likelihood, charitable giving, conservation marketing, environmental ethics

1. Introduction

Successful conservation initiatives often require support from local communities (Berkes, 2004), but other types of support from more remote publics can be essential as well. Many conservation non-governmental organizations (NGOs) rely on private monetary donations to support their work. The Nature Conservancy, USA, for example, received roughly 55% of its annual 2017 income from individual donors, reporting over \$600,000 in private financial contributions, compared with just above \$117,000 in government funds (The Nature Conservancy, 2017). Recent research on “conservation marketing” seeks to inform the effective design of conservation communication and outreach strategies (Wright et al., 2015). This work reflects a growing awareness that conservation NGOs (and conservationists generally) need to understand how they can communicate with the general public to garner support, including financial contributions.

Past research has shown that people respond to fundraising appeals, in part, based on who or what is portrayed as a beneficiary of the cause or organization. For example, Deshpande and Spears (2016) reported on a study in India in which messages soliciting money for individual Muslims or members of higher castes generally received larger donations than messages soliciting money for individuals of lower castes. In the conservation arena, Thomas-Walters and Raihani (2017) found that messages featuring conservation “flagships” (charismatic and widely popular species) generated larger donations than messages featuring less charismatic species. The number of beneficiaries represented also influences donation behavior. Researchers have found people often donate less when large groups of people, or “statistical victims,” are depicted, compared with messages presenting just one person, or “identifiable victim” (Slovic, 2007; Deshpande and Spears, 2016). Interestingly, people may not respond in the same way to nonhuman victims: in a recent study, outreach messages presenting a single wildlife victim did not generate higher donations for a conservation organization than messages presenting multiple wildlife victims (Thomas-Walters and Raihani, 2017).

Most research, including the work cited above, verbally and/or visually manipulated the representation (e.g., identity or number) of either all human or all nonhuman beneficiaries. However, the beneficiaries of conservation potentially include both humans *and* nonhumans, necessitating a basic choice about which type(s) of entities (human, nonhuman, or both) to emphasize in outreach messages. In recent years, many in the scholarly conservation community have chosen to emphasize the human beneficiaries of conservation, highlighting the instrumental values, or “ecosystem services,” humans receive from ecosystems and biodiversity (Abson et al., 2014). This shift is precipitated, in part, by the perceived need to conceptualize and quantify the value of nonhuman nature in a form that will be influential in practical policy and management contexts (e.g., Luck et al., 2012; Fisher and Brown, 2014). But the ascendancy of the ecosystem services framework has also, at least in part, been motivated by recognition that conservation efforts require social support to succeed (Kendal and Ford, 2018). This realization, paired with a common assumption that “protecting biodiversity or nature for its intrinsic value...[is] inspiring for relatively narrow segments of the population” (Marvier, 2014, p. 2; also, e.g., Luck et al., 2012; Marvier and Kareiva, 2014), has galvanized many conservationists to find and emphasize other (e.g., instrumental) reasons for conservation, which will “inspire” broader segments of the public to support their work. Though widely embraced, the “nature for humans” approach (Mace, 2014) has also been controversial, generating extensive debate about the goals, methods, and very meaning of conservation (e.g., Soulé, 2013; Tallis and Lubchenco, 2014; Sandbrook, 2015;

Pearson, 2016). However, scant research has explicitly examined the effectiveness of “nature for humans” as a messaging strategy, or tested it against “nature for nature’s sake” (Doak et al., 2013; Bekessy et al., 2018).

In line with this objective, Marvier and Wong (2012) presented a sample of the American public with two statements, one suggesting the “best reason” for conservation is for “the benefits people can derive,” and the other suggesting the best reason to protect nonhuman nature is “for its own sake.” They found a small majority of the general sample favored the first reason, although the majority was more pronounced among political conservatives and African Americans. On this basis, they concluded conservationists should highlight the human benefits of conservation in order to attract more diverse demographics of supporters. Although Marvier and Wong’s (2012) study shows human benefits represent an important motivation for conservation, they did not associate ratings of agreement with any behavioral outcomes (e.g., membership with a conservation organization or intentions to donate). Therefore, we cannot conclude from their results that appeals to human conservation beneficiaries are more effective, in any practical sense, than appeals to nonhuman beneficiaries (i.e., nonhuman nature for its own sake).

Marvier and Wong (2012) further observed that the effectiveness of outreach messages depends, to some extent, on demographic characteristics of the message recipients themselves. Indeed, research shows persuasive messages that “match” (i.e., are compatible with) some characteristic of the message recipient generate more positive attitudes and, under some conditions, produce desired behaviors more effectively than non-matching messages (e.g., Nelson and Garst, 2005; Krantz and Monroe, 2016). Matching effects can be explained within the elaboration likelihood model (Petty and Cacioppo, 1986), which posits that people invest cognitive energy into actively processing messages (i.e., considering, scrutinizing, deliberating) to the extent that they are motivated and able, otherwise relying on heuristics or contextual cues to evaluate the message. When people engage in active processing, or “elaboration,” the attitudes they form toward the message, and hence the effectiveness of the persuasive effort, are likely to be based on the quality of the argument(s). However, argument quality is not necessarily an objective property of a message. Rather, quality is judged through the subjective lens of the individual, including her or his extant values, attitudes, and beliefs (Lord et al., 1979; Lavine and Snyder, 1996). Research conducted both within and outside the elaboration likelihood framework has shown that deliberative processes and consequent evaluations of argument quality are often biased in favor of messages matching a message recipient’s pre-held opinions and against non-matching messages, particularly when the message pertains to a matter of high importance to the recipient (Edwards and Smith, 1996; Hart and Nisbet, 2012; Kahan, 2013). Along with enhancing perceived argument quality, messages that are compatible with some salient characteristic of the message recipient and/or the message context are processed more readily than incompatible messages, a so-called “fluency” effect often associated with the formation of positive attitudes (Lee and Labroo, 2004; Kidwell et al., 2013).

Matching effects have been observed for different types of individual characteristics (e.g., Ryffel and Wirth, 2016), but we are interested specifically in the effect of messages that match recipients’ beliefs about value in the nonhuman world. Various theoretical traditions provide guidance on how values and environmentally-relevant beliefs affect people’s perceptions of and relations with the nonhuman environment (e.g., Dietz et al., 2005; Manfredi et al., 2009). For the present research we adopt a framework informed by scholarship in environmental ethics. Whereas, in the psychological literature, values are described as stable goals or end states (Schwartz and Bilsky, 1987), philosophers define value as a property of its bearer that commands

a favorable attitude (Zimmerman, 2001). Ethicists distinguish between instrumental value, i.e., the value of an entity for some other entity, and intrinsic value, i.e., the value of an entity (or its interests) for its own sake, beyond and in addition to any purposes it may serve for other ends (Vucetich et al., 2015). Environmental ethicists have theorized that the types of entities ascribed with intrinsic value define the scope of a person's "moral community," which refers to the set of entities valued intrinsically, i.e., not just as means, but also as ends in themselves (Goralnik and Nelson, 2012). Environmental ethicists have posited four main ways the moral community might be defined. Anthropocentrism includes only humans in the moral community; zoocentrism includes humans and individual nonhuman animals; biocentrism includes all individual living beings; and ecocentrism includes all individual living beings and ecological collectives, such as species and ecosystems (Goralnik and Nelson, 2012). In the current research we refer to the breadth of an individual's moral community as "moral inclusivity." Individuals with larger, more diversified moral communities are considered more inclusive, and individuals with smaller, more homogeneous moral communities are considered less inclusive.

If an individual responds, in part, to the type(s) of beneficiaries portrayed in conservation outreach messages, we hypothesize this response will also depend, in part, on whether the type(s) of beneficiaries portrayed in the message match with entities encompassed in the individual's operative notions of the moral community. To test this general hypothesis we posed the question:

How does the type of conservation beneficiary represented in a conservation outreach message affect a person's attitudinal and behavioral responses to the message, and to what extent do these effects depend on a person's moral inclusivity?

For less inclusive individuals we predicted:

H1. Messages representing humans as beneficiaries of conservation will match less morally inclusive individuals' operative notions of the moral community, generating more positive attitudinal and behavioral responses than messages representing only nonhuman or both human and nonhuman beneficiaries.

For more inclusive individuals we formulated two alternative hypotheses:

H2a. Messages representing humans, nonhumans, or both humans and nonhumans as beneficiaries of conservation will all match more inclusive individuals' operative notions of the moral community, generating equally positive attitudinal and behavioral responses. This result would suggest individuals respond to the simple presence of intrinsically valued entities in the message. We refer to this as the *simple value-matching hypothesis*.

H2b. Messages representing both humans and nonhumans as beneficiaries of conservation will most fully match more inclusive individuals' operative notions of the moral community, generating more positive attitudinal and behavioral responses than messages representing either only humans or only nonhumans as beneficiaries. This result would suggest individuals respond not merely to the presence but also the number of intrinsically valued entities represented in the message. We refer to this as the *additive value-matching hypothesis*.

2. Materials and methods

To investigate how the type of beneficiary depicted in outreach messages affects support for conservation, we conducted an experiment. We designed three beneficiary treatments, which were administered in a survey distributed online to a non-representative sample of the American public in August 2017. This process was undertaken with the approval of the Oregon State University Institutional Review Board, which ensures ethical conduct in research with human subjects.

Survey administration was handled by a designated project management team at Qualtrics, LLC. Qualtrics, LLC is a corporate entity that provides, among other things, online panel services for research and marketing. Survey respondents were online panelists, i.e., individuals who have signed up to take surveys in return for compensation. A battery of panelists registered with Qualtrics, LLC was emailed an invitation to take a new survey, and those who chose to accept followed a link to access and complete the survey. This process was repeated until our target sample size of 1,600 had been achieved. The sampling procedure was designed to capture a roughly even mix of political conservatives and liberals, since political orientation was expected to moderate individuals' responses to part of the experimental manipulation (see below, and Online Appendix B). Therefore, the initial administration phase targeted only respondents who self-identified as "conservative" in their Qualtrics panelist profiles. Once approximately half the desired sample size had completed the survey, email invitations were directed exclusively toward panelists who self-identified as "liberal" in their panelist profiles.

The survey included three parts, each of which is described below. Here we report on only a subset of the survey data, but the full questionnaire is provided in online Appendix A.

2.1 Survey part one: information about respondents.

The first part of the survey collected select demographic and background information about respondents, including political orientation, religiosity, and moral inclusivity (for single-item measures of political orientation and religiosity, see online Appendix A, Section 1.1, Questions 5-6). Additional demographic information was appended to survey responses from participants' Qualtrics panelist profiles.

For the present analysis we used 13 items (Section 1.3, Questions 1-13 in online Appendix A) to measure respondents' moral inclusivity. These items were designed to capture variability in the extent to which different types of entities (humans, individual nonhuman animals, individual living beings, and ecological collectives) are included in the respondent's moral community (see Table 1). We used plants as a case of individual living beings, so as to clearly differentiate beliefs about individual animals from beliefs about individual non-animal living beings, and we used species and ecosystems as examples of ecological collectives. The items employed a Likert response format ranging from 1 to 7 (strongly disagree to strongly agree). Higher numbers correspond to more inclusive views of the entity in question.

2.2 Survey part two: outreach message manipulation

In the second part of the survey, respondents were shown a flyer promoting the cause of conservation. Verbal messages communicated in the flyers systematically manipulated two factors, the first being the type of conservation beneficiary represented in the message. We call

this factor “beneficiary.” The second factor, called “moral foundation” (Graham et al. 2009), varied how conservation was framed as a moral issue, by either invoking 1) community ties, authority, and the sanctity of nature (“binding” foundations), or 2) avoidance of harm and fairness (“individualizing” foundations). Results of the second factor manipulation are not reported on here, but information is provided in online Appendix B.

Two messages represented only human beneficiaries (HMN). An example is,

“Newborn babies, tomorrow’s leaders. Tiny toddlers, tomorrow’s dreamers. If we destroy this one planet, we destroy their future. Why conservation? To protect their right to a life worth living. It’s only fair.”

Two messages represented only nonhuman beneficiaries (NON). An example is,

“Birds nesting in peaceful forests. Fish grazing in coral reefs. If we destroy this one planet, we destroy their future. Why conservation? To protect their right to a life worth living. It’s only fair.”

Two messages represented combined human and nonhuman beneficiaries (COMB). An example is,

“Birds adrift on a peaceful breeze. Hopeful children, tomorrow’s dreamers. If we destroy this one planet, we destroy their future. Why conservation? To protect their right to a life worth living. It’s only fair.”

The seventh message (“*Why conservation? For every reason imaginable*”), designed as a control, did not depict any specific type of beneficiary.

Each respondent was randomly assigned to view only one of the seven messages. We used this “between-subjects” design (as opposed to a “within-subject” design, in which every respondent would have viewed all seven messages) for two reasons. First, we sought to reduce response burden by minimizing the number of messages each person was asked to read. Second, we hoped to more closely approximate a realistic outreach scenario, in which an individual would receive and respond to only one message (e.g., a mailing or internet ad). We used a visual image (a color-enhanced photo of the Earth) that would have face validity as a backdrop for a conservation outreach flyer, but would neither confound nor distract attention from the experimental manipulations presented in verbal messages. This image was held constant across treatments. Efforts were also made to keep other aspects of the verbal message (e.g., grammatical structure and length) relatively consistent. All seven messages are shown in online Appendix A. Manipulation checks confirming the effectiveness of the beneficiary message manipulation are reported in online Appendix B (Table A1). Responses to the manipulation check items suggested the control was not perceived as a “no-beneficiary” message, and so did not serve as an adequate control for the beneficiary manipulation (see online Appendix B for results and brief discussion). We therefore excluded the control from further analysis.

2.3 Survey part three: response variables

Attitudes toward the flyer were measured with three items (see online Appendix A, Section 3.1, Questions 1-3). These items employed a Likert response format ranging from 1 to 7 (strongly disagree to strongly agree). Higher numbers correspond to more positive evaluations of the message.

Donation was measured following a procedure validated by Clements et al. (2015). We gave each respondent five dollars in thanks for his or her participation, but also offered the opportunity to designate some proportion of the gift as a donation to a conservation organization. Before beginning the survey respondents were asked to provide informed consent, at which time they were told the research project was investigating how and why people react positively or negatively to conservation outreach messages. Respondents were not explicitly informed their donations would be recorded as data, in efforts to render the decision context as naturalistic as possible. After entering whatever amount they wished to donate (\$0-\$5), on the next page respondents were informed that their donation amount had been recorded as data. Because this procedure entailed an element of deception, respondents were given the option to withdraw from the sample. Payments owed to each person were calculated following data collection and distributed by Qualtrics, LLC. The balance was donated in a lump sum to the Monterey Bay Aquarium.

For this analysis we report on two donation response variables: decision to donate (a dichotomous variable, yes/no) and donation amount (a continuous variable ranging from \$0.01 to \$5.00). Zero donations were excluded from donation amount, since they were accounted for in the measure of decision to donate.

2.4 Data analysis

Statistical data analysis was conducted in IBM SPSS (version 24). We used principal components analysis (PCA) to group the 13 moral inclusivity items for hypothesis testing. PCA is a multivariate statistical procedure used to reduce a set of measured variables to a smaller number of composites, which are computed as linear combinations of the original variables (Tabachnik and Fidell, 2013). Principal components are extracted by grouping items in n -dimensional space in the configuration that best accounts for observed variance between uncorrelated sets of similar item scores (Tabachnik and Fidell, 2013). Although closely related to factor analysis, PCA was deemed more appropriate for our objectives since our intent was not to test the latent variable structure of the moral inclusivity scale, per se, but rather to reduce the scale for operational purposes (Tabachnik and Fidell, 2013). We used PCA with varimax rotation, retaining only components with eigenvalues greater than one and suppressing coefficients below 0.4. Cronbach's alpha (α) was used to confirm internal consistency of the resulting components, and composite variables were computed by averaging each respondent's scores on the set of items loading on each component. The resulting composites ranged from 1 to 7, with scores below three generally suggesting exclusion of the entities in question from the moral community; scores above five generally suggesting inclusion of the entities in question within the moral community; and a score of four suggesting ambivalence toward the entities in question as members of the moral community. These composite variables were then entered in a k-means cluster analysis. K-means clustering is used to classify respondents into a specified number of groups by assigning them to whichever cluster minimizes the distance between item scores and the cluster mean (Everitt, 2011). The resulting clusters were subsequently used in statistical analyses, described below, as a categorical measure of overall moral inclusivity ("inclusivity").

We also used Cronbach's alpha to assess the internal consistency of the three attitude items, and created a composite by averaging each respondent's individual attitude item scores. The resulting composite ("attitudes") ranged from 1 to 7, with 1 representing the least positive evaluation and 7 representing the most positive evaluation of the message.

To test our hypotheses on the two continuous response variables (attitudes and donation amount), we used analysis of covariance (ANCOVA). Information about ANCOVA assumption testing is provided in online Appendix B. We entered beneficiary and inclusivity as factors, along with a term for their two-way interaction. Where significant main effects were detected, we used Bonferroni-adjusted post hoc comparisons to test for pairwise differences between groups. Where the interaction was significant, simple effects analysis was used to test for differences in means between levels of one factor (beneficiary or inclusivity) at each level of the other (inclusivity or beneficiary). As covariates we entered age, income, religiosity, political orientation, and education, all known predictors of environmental attitudes, proenvironmental behaviors, and charitable giving (Bekkers and Wiepking, 2011; Gifford and Nillson, 2014). Each was treated as a continuous variable, with political orientation ranging from (1) least liberal (or most conservative) to (7) most liberal. Respondents who selected "Prefer not to answer" for any of the demographic questions were excluded from analysis, along with libertarians and self-identified political "others" (who represented less than two percent of the total sample). We also controlled for effects related to the second manipulated factor (moral foundation) and its two-way interaction with political orientation (see online Appendix 2).

We used logistic regression to test our hypotheses on the dichotomous response variable (decision to donate). The model included terms for beneficiary, inclusivity, and their two-way interaction, along with the control variables listed above. Because the beneficiary-inclusivity interaction was not statistically significant, it was subsequently removed. Below we report on the resulting main effects model.

3. Results

The survey was completed by 1600 individuals, but 17 percent ($n = 269$) chose to withdraw following the donation de-brief, reducing the sample size to $N = 1331$. Removing the control group brought the overall sample size to $N = 1141$. 372 respondents viewed HMN, 384 viewed NON, and 385 viewed COMB. Full descriptive information about the sample is in online Appendix B, Table A2.

3.1 Moral inclusivity

Three principal components explained a cumulative 61.57 percent of the variance in the 13 moral inclusivity items (Table 1). The first component was comprised of six items suggesting inclusion of ecological collectives in the moral community. Reliability on these items was good ($\alpha = 0.88$), so each respondent's six item scores were averaged into one composite measure, which we call "MI collective." The second component was comprised of four items suggesting inclusion of individual plants and animals in the moral community. These four items also had acceptable internal consistency ($\alpha = 0.78$), so each respondent's scores were averaged to create a second composite, which we call "MI individual." The third component included three items suggesting inclusion of human beings in the moral community. Initial analysis indicated a higher alpha could be achieved by excluding the second item, but the alpha level of the remaining two

items ($\alpha = 0.51$) still fell below conventionally acceptable levels. An “adequate” alpha level is determined by the level of precision required in the application of the measure (Cortina, 1993). While ideally our scale items would have reliably characterized specific beliefs and values associated with human beings as members of the moral community, we required only a coarse measure confirming the theoretically plausible and empirically supported (Crimston et al., 2016) assumption that humans are generally included in people’s moral communities. As anticipated, reported agreement (i.e., scores of five or higher) was high for both items (87 and 97 percent of the sample, respectively). We therefore proceeded in spite of the low reliability score, noting that this section of the scale warrants further refinement in future research. We averaged each respondent’s scores on the two items to form a third composite, which we call “MI human.”

K-means cluster analysis specifying three categories returned groups that were interpretable within our theoretical framework (Figure 1). Cluster one converged around the lowest means for all three composites. However, whereas the cluster mean for MI human was on the inclusion side of the range, cluster means for MI individual and MI collective fell within the range of scores suggesting exclusion of, or at most ambivalence toward, nonhuman individuals and collectives. Cluster three converged around the highest means for all three composites, suggesting respondents in this cluster reported strong beliefs that humans, nonhuman individuals, and ecological collectives are all included in their moral community. Compared to clusters one and three, cluster two converged around intermediate means on all three composites, suggesting respondents in this cluster include humans, nonhuman individuals, and ecological collectives in their moral community, but are more tentative about nonhuman entities (and particularly nonhuman individuals) than respondents in cluster three. Based on these interpretations, clusters one, two, and three were labeled “less inclusive,” “somewhat inclusive,” and “broadly inclusive,” respectively.

3.2 Attitudes

Cronbach’s alpha was improved by removing the third attitude item, so we averaged each respondent’s scores on only the first two items to create the composite attitude measure ($\alpha = 0.94$). Beneficiary was not a significant predictor of mean attitude scores, and we found no significant interaction between beneficiary and inclusivity (online Appendix B, Table A3). However, attitudes varied significantly between inclusivity groups. Mean attitude scores were 6.72, 6.01, and 5.00 for broadly, somewhat, and less inclusive individuals, respectively (Table 2). All pairwise differences were statistically significant ($p < 0.001$).

3.3 Donation

Both inclusivity and beneficiary were significant predictors of decision to donate (online Appendix B, Table A4). Broadly and somewhat inclusive individuals were 4.35 and 3.98 times more likely to donate, respectively, than less inclusive individuals (Table 2). Individuals who viewed NON were 1.60 times more likely to donate than individuals who viewed HMN.

Both inclusivity and beneficiary also predicted donation amount (Table 2; additional information in online Appendix B, Table A5). On average, broadly inclusive individuals donated \$0.74 more than less inclusive individuals and \$0.52 more than somewhat inclusive individuals. Individuals who viewed NON and COMB donated \$0.56 and \$0.55 more, respectively, than

individuals who viewed HMN, although the difference between HMN and COMB was only marginally significant ($p = 0.051$).

However, both main effects were qualified in the presence of a significant interaction between beneficiary and inclusivity. Donation amounts differed by beneficiary only among less inclusive individuals (Table 2). In this group, only mean donation amounts for HMN and NON were significantly different, with less inclusive individuals who viewed NON donating \$1.74 more, on average, than less inclusive individuals who viewed HMN. Donation amounts did not differ significantly by beneficiary type among somewhat or broadly inclusive individuals. Conversely, donation amounts differed significantly between inclusivity groups only for individuals who viewed HMN, with broadly inclusive individuals donating \$1.74 more than less inclusive individuals and \$0.67 more than somewhat inclusive individuals. Both differences were statistically significant. Inclusivity was a marginally significant predictor of donation amount overall among individuals who viewed COMB ($F_{2, 692} = 3.10$, $p = 0.046$, $\eta_p^2 = 0.009$), but only the pairwise difference between somewhat and broadly inclusive individuals remotely approached statistical significance ($p = 0.08$). Although the conservative Bonferroni correction may have precluded detection of a significant effect, we report only suggestive evidence that donations for COMB differ between somewhat and broadly inclusive individuals. Donation amounts among individuals who viewed NON did not differ significantly between inclusivity groups.

4. Discussion

We investigated how the type of beneficiary represented in outreach messages affects two indicators of support for conservation; attitudes and donations. We generally predicted that messages matching respondents' moral inclusivity would elicit relatively stronger positive responses. Specifically, we hypothesized that less inclusive individuals would favor human beneficiary messages (H1). For more (i.e., somewhat and broadly) inclusive individuals we formulated two alternative hypotheses. According to the *simple value-matching hypothesis* (H2a), we would observe no differences in response based on beneficiary type. According to the *additive value-matching hypothesis* (H2b), we would observe a stronger positive response to messages highlighting both human and nonhuman beneficiaries, compared to messages highlighting only one or the other. We found no support for H1 or H2b, and limited support for H2a. Because it was beyond the scope of this largely exploratory study to investigate mechanisms, the discussion that follows should be considered a plausible interpretation of findings. Future research should seek to isolate and test specific mechanisms that might explain variability in attitudinal and/or donation responses.

Before proceeding, it is important to note that an overwhelming proportion (0.96) of our sample responded "yes" when asked if nature conservation is important (Supplemental Materials, Section 1.1, Question 4). It is perhaps unsurprising that so many people answered in the affirmative, since the response item was broadly stated, required little commitment from the respondent, and forced no tradeoffs. Regardless, our results should be interpreted with the caution that findings do not necessarily generalize to people who do not, in some sense, believe nature conservation is important. Indeed, our sample's overall consensus on the importance of conservation perhaps partially explains why we did not observe more pronounced treatment effects (as discussed next). However, our results are generally consistent with other studies showing a majority of Americans hold positive attitudes toward conservation. For example, a

2012 report on survey data commissioned by The Nature Conservancy, USA concludes, “it is clear that conservation is an issue that unites, rather than divides, the American people” (Weigel and Metz, 2012), and the most recent data available from the World Values Survey shows nearly 87% of Americans consider “looking after the environment...to care for nature and save life resources” important (Inglehart et al., 2014). Though comprised primarily of conservation supporters, it appears our sample represents an important segment of the American public in this regard.

Turning back to results, we found no effect of beneficiary type on attitudes, refuting hypothesis H1 that lower inclusivity respondents would more positively evaluate messages highlighting human beneficiaries. The lack of treatment effect among more inclusive respondents is consistent with the simple value-matching hypothesis H2a. However, rather than trying to explain why value-matching effects would be observed for more but not less inclusive respondents, the overall lack of treatment effects can more parsimoniously be interpreted as a function of low cognitive processing. On first viewing the message, and in questions immediately following, respondents were asked to report opinions in an anonymous survey format, with no obvious repercussions. According to the elaboration likelihood model, people have low motivation to engage extensively with message content when it is not personally relevant to them, relying instead on generalized cues to form an evaluation (Petty and Cacioppo, 1986). If reacting somewhat intuitively to more basic stimuli (e.g., the visual depiction of Earth in the flyers; the enlarged word “conservation,” which a majority of our sample considered to be important; or even the broader survey context, as discussed below), individuals’ responses may have reflected pre-held beliefs as opposed to careful consideration of the message content (e.g., Hart and Nisbet, 2012). Consistent with this interpretation, inclusivity was a strong, significant predictor of attitudes. In contrast, when prompted by a decision with real (albeit small) consequences, more people may have been motivated to process and respond to the content of the message itself (e.g., Petty et al., 1983), explaining observed treatment effects on donation.

Against our general hypothesis that beneficiary effects would depend on respondents’ moral inclusivity, the nonhuman beneficiary message was overall more likely to elicit a donation than the human beneficiary message, regardless of inclusivity. We offer two plausible explanations for this result. The first relates to the identifiable victim effect. Across treatments, beneficiaries were represented generically in abstract text, rather than as identifiable victims. Thomas-Walters and Raihani (2017) found no evidence of an identifiable victim effect in a conservation outreach context, a divergence from research showing that humanitarian outreach messages depicting statistical human victims tend to produce less favorable donation outcomes than messages depicting identifiable human victims (Slovic, 2007). The overall lower rate of donation for treatments representing only human beneficiaries may reflect this differential, if the decision to donate was dampened by the lack of identifiable victims for the human but not the nonhuman messages. Alternatively, the higher donation rate for nonhuman beneficiaries can be interpreted as a fluency effect, whereby familiar or predictable (as opposed to novel) stimuli are processed with relative ease, leading to favorable evaluations (Lee and Labroo, 2004). U.S. publics may be more accustomed to conservation appeals highlighting nonhuman entities, especially given the common usage of wildlife flagships for conservation outreach (Clucas et al. 2008; Thomas-Walters and Raihani, 2017). A message aligned with respondents’ expectations of what a conservation outreach message “should” look like may have been processed more fluidly than a somewhat discordant message, explaining the slightly more positive response to nonhuman as opposed to human beneficiaries. As noted above, our sample almost unilaterally

reported favorable views of conservation. Being interested or perhaps even invested in the cause, respondents likely held pre-formed beliefs or expectations regarding conservation, and therefore may have been especially prone to fluency effects. The combined treatment, on the other hand, presented both human and nonhuman beneficiaries, an integration that may have either tempered the identifiable victim effect or enhanced the message processing fluency. Either interpretation could explain why the combined beneficiary effect on decision to donate did not differ significantly from the human beneficiary effect or the nonhuman beneficiary effect.

In tests on donation amount, we found no beneficiary effect among somewhat or broadly inclusive individuals. For these two more inclusive groups, combined messages highlighting human and nonhuman beneficiaries did not elicit higher donations than messages highlighting one or the other. These results are consistent with our simple value-matching hypothesis H2a, which predicted people would respond to the mere presence, as opposed to the number, of intrinsically valuable entity types. We qualify this interpretation with the important caveat that the between-subjects design of our experimental manipulation lent itself more readily to the simple as opposed to the additive value-matching effect, since respondents were not asked to compare messages representing only one type of entity (human *or* nonhuman) with messages representing two types (human *and* nonhuman). We cannot rule out the possibility that, had a somewhat or broadly inclusive individual been presented with both a (non)human and a combined message, she would have donated more to the combined message, as a more comprehensive representation of the breadth of her moral concern. Therefore, this study provides only suggestive evidence for a simple value-matching effect. Future research should seek to replicate these results in a within-subject experimental design.

Against hypothesis H1 that human beneficiary messages would elicit the highest donations from less inclusive individuals, respondents in the less inclusive group actually donated less money to human beneficiary messages than either of the other two messages (although only the difference between human and nonhuman beneficiaries was statistically significant). These results suggest the effects of value-matching appeals in conservation outreach messages may be conditioned in important ways by contextual factors; in this case, the broader survey context. Although a message representing only human beneficiaries matched less inclusive individuals' operative notions of the moral community, throughout the survey these individuals may have formed opinions about our (the researchers') values and beliefs based on our formulation of the moral inclusivity questions. The flyers were presented immediately following a series of questions asking, e.g., if fungi have intrinsic value, clearly indicating that we entertain such notions as valid propositions. Against this perhaps striking and, for less inclusive individuals, provocative backdrop, the values communicated in the human message may have seemed discrepant or even contrived, raising suspicion about alternative motivations or manipulative intentions behind the message (Petty and Cacioppo, 1979). For many people, this awareness may have deterred donation in the first place. For others, heightened awareness of persuasive efforts may have merely attenuated the response. Liu et al. (2016) report that when an argument is compatible with pre-held beliefs, but judged to be weak, individuals tend to deliberate more and form less extreme attitudes toward the argument. In a similar way, less inclusive individuals, who (like most of the sample) were generally amenable to conservation, perhaps supported and found resonance in the human beneficiary message, yet questioned its genuineness in the context of the survey. This ambivalence may have manifested as a decision to donate, but a lesser amount.

Somewhat inclusive individuals exposed to the human message also donated less on average than broadly inclusive individuals, although the difference between these groups was less pronounced than between less and broadly inclusive individuals. Compared with less inclusive individuals, somewhat inclusive individuals may have found the inclusivity questions more commensurate with their values and beliefs, perhaps rendering the normative undertones of the overall survey less salient. If so, any perceived discrepancy between the survey and the content of the human beneficiary message would have been less acute for somewhat inclusive individuals, resulting in only slightly depressed donation amounts relative to broadly inclusive individuals.

Finally, and also against hypothesis H1, the nonhuman and combined messages did not elicit lower donations from less inclusive individuals than from either somewhat or broadly inclusive individuals. Here we suspect the effect of value mismatch was predominantly reflected in the more basic decision not to donate by less inclusive individuals (who were least likely to donate overall, regardless of beneficiary type). The donation choices of less inclusive individuals who did donate might be explained by processes cited above, e.g., the relatively high processing fluency facilitated by a nonhuman beneficiary message in the context of this survey or in association with “conservation.” But we also cannot rule out that less inclusive individuals who donated after viewing nonhuman or combined messages considered the instrumental values of the nonhuman entities mentioned in the flyer, in spite of our efforts to present those entities in a light suggesting intrinsic value. People are active participants in, rather than passive consumers of, persuasive communications (Petty and Cacioppo, 1986). As such, it is plausible that less inclusive individuals interpreted the message to align with their own values and beliefs, and donated accordingly.

As with all scientific studies, the present research has several important limitations that warrant recognition. The donation format we utilized was somewhat artificial, since contributions were made from a small incentive fee rather than earned income. In addition, although the donation was elicited “in the spirit of the survey and the message [respondents] saw,” the donation option was not explicitly associated with the flyer messages, possibly undermining our results. By the time the respondents arrived at the donation option they had viewed the message twice, with extensive prompting to engage with the specific message content. The active and consequential decision context surrounding the donation variables may have also prompted individuals to process and respond to the messages. As such, it is reasonable to expect respondents’ donation decisions were informed, at least in part, by the messages they viewed. Nonetheless, future research should seek to establish stronger links between donation and message content, and perhaps in a more naturalistic donation setting using mixed (quantitative and qualitative) methods. We also note that treatment effects on both donation response variables were small, and statistical models explained a relatively low proportion of variance. This suggests other aspects of the message, the message recipient, and/or the context may offer more robust explanations for donation behavior.

In addition, the nature of our sample limits the scope of inferences that can be drawn from our results. Online panels provide convenience and allow for larger samples than are otherwise achievable, but respondents are self-selected and do not necessarily represent views of the broader public. Although we had a roughly balanced representation of various metrics of demographic diversity, self-identified Caucasians constituted nearly 84% of the sample. Discourse in conservation has increasingly highlighted the importance of understanding and incorporating diverse perspectives (Gould et al., 2017). Future studies should therefore replicate

this study with a more representative sampling of diverse social groups both within and outside the U.S.

5. Conclusions

Many conservationists have embraced the human benefits, or “ecosystem services,” of nonhuman nature as an analytical and/or communications strategy, based partly on the assumption that conservation will generate broader public support if framed as an effort to protect human wellbeing (Luck et al., 2012; Marvier and Wong, 2012; Marvier and Kareiva, 2014; also Bekessy et al., 2018). Evidence reported here challenges this assumption, suggesting “nature for humans” may actually be a less successful strategy for conservationists than “nature for nature’s sake” (i.e., “nature for nonhumans”). Critics may point out that we interpreted message effects in the context of the larger survey, a situational variable that would not obtain in real-world applications. While there is some merit to this claim, real-world communications clearly do not occur in a social vacuum. When solicitations are made, e.g., by conservation NGOs, message recipients are still likely to associate values and norms with the organization and the cause, creating a decision context not altogether dissimilar from our survey. We suggest conservationists representing or eliciting support for their work are well advised to attend to these sorts of contextual variables, which may influence people in unexpected ways.

A growing body of research suggests people holding strictly anthropocentric views are relatively rare, at least among Western publics, and most attribute intrinsic value to nonhuman nature or some set thereof (de Groot et al., 2011; Vucetich et al., 2015; Lute et al., 2016). Complementing this work, our results suggest conservation outreach messages emphasizing human beneficiaries are not more effective than messages emphasizing nonhuman nature as a valued beneficiary in itself. In fact, results reported here even suggest messages emphasizing human beneficiaries could potentially backfire, deflecting support from the (less inclusive) sectors of the public they may initially seem most likely to attract. Based on these findings, we suggest conservation outreach or conservation marketing that targets the general public should appeal to non-anthropocentric values and beliefs by conveying the intrinsic value of nonhuman nature. Although messages highlighting the human beneficiaries of conservation are compatible with a non-anthropocentric perspective, they are also and more obviously compatible with an anthropocentric perspective, and may create or perpetuate the false impression that anthropocentrism prevails in society at large. Promoting the protection of nonhuman entities as bearers of intrinsic value and proper objects of moral concern may be an effective way for conservationists to build social support, while also nurturing and normalizing non-anthropocentric values and beliefs.

Acknowledgements: We are deeply grateful to A. Muldoon, M. Needham, T. Hall, A. McCright, T. Dietz, and J. Clements for their invaluable insights on survey development and data analysis. Additional thanks to L. DiGregorio, M. Park, and B. Morrissette for their assistance navigating federal grants.

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Table 1. Principal components resulting from principal components analysis with orthogonal rotation on 13 moral inclusivity items. Only component loadings greater than 0.4 (shown in bold) were retained to create moral inclusivity (MI) composite variables. N = 1141.

Scale Items	Principal components (PC) and PC loadings		
	PC 1	PC 2	PC 3
	MI collective	MI individual	MI human
People have a moral obligation to consider how their decisions might harm or benefit an ecosystem, even if the ecosystem has no apparent use.	0.80	0.22	0.20
It makes no sense to talk about respecting an ecosystem (R)	0.78	0.06	0.12
When people cause the loss of an ecosystem, they have committed a moral wrong against the ecosystem.	0.77	0.34	0.04
When people cause the extinction of a species, they have committed a moral wrong against the species.	0.70	0.38	0.05
It makes no sense to talk about respecting a species. (R) ¹	0.69	0.18	0.14
People have a moral obligation to consider how their decisions might harm or benefit a species, even if the species has no apparent use.	0.68	0.37	0.23
Every plant deserves respect as a living creature.	0.29	0.78	-0.04
The wellbeing of individual plants is not a matter of moral concern to me. (R)	0.26	0.71	-0.13
Every individual animal possesses a dignity that deserves respect.	0.29	0.70	0.35
The wellbeing of an individual animal matters, even if it does not affect the wellbeing of people.	0.19	0.68	0.41
As a basic principle, people ought to demonstrate respect for other individual people.	0.10	0.22	0.74
Every person has value above and beyond his or her usefulness for others.	0.09	0.04	0.71
<i>In general, I would say human suffering is a moral issue.</i> ²	0.13	-0.05	0.56
Eigenvalue	3.59	2.61	1.81
Variance explained	27.59	20.06	13.92

¹(R) indicates item was reverse-coded for analysis.

² Italicized item was excluded from further analysis to improve internal reliability of items measuring inclusivity of human beings.

Table 2. Model estimates of mean attitude scores, donation odds ratios, and donation amounts, with 95% confidence intervals. The three levels of beneficiary are human only (HMN), nonhuman only (NON), and both human and nonhuman (COMB). Estimates are reported at average values of education, age, religiosity, income, and political orientation. For each subgroup of values reported by column, non-significant pairwise differences ($p > 0.05$) are denoted by shared superscript letters.

	Mean attitude score [95% CI] ¹ n = 1,013	Donation odds ratio [95% CI] ² n = 1,013	Donation amount [95% CI] n = 708
All respondents			
Less inclusive	5.00 ^a [4.85, 5.14]	1.0 ^a	\$2.99 ^a [\$2.54, \$3.44]
Somewhat inclusive	6.01 ^b [5.92, 6.10]	3.98 ^b [2.67, 5.93]	\$3.22 ^a [\$3.01, \$3.43]
Broadly inclusive	6.72 ^c [6.63, 6.81]	4.4 ^b [2.88, 6.58]	\$3.73 ^b [\$3.52, \$3.95]
All respondents			
Viewed HMN	5.95 ^a [5.84, 6.05]	1.0 ^a	\$2.94 ^a [\$2.61, \$3.28]
Viewed NON	5.92 ^a [5.82, 6.03]	1.60 ^b [1.13, 2.27]	\$3.51 ^b [\$3.22, \$3.79]
Viewed COMB	5.86 ^a [5.75, 5.97]	1.35 ^{a,b} [0.96, 1.91]	\$3.49 ^{a,b} [\$3.19, \$3.79]
Less inclusive			
Viewed HMN	--	--	\$2.01 ^a [\$1.15, \$2.87]
Viewed NON	--	--	\$3.75 ^b [\$3.05, \$4.45]
Viewed COMB	--	--	\$3.22 ^{a,b} [\$2.47, \$3.96]
Somewhat inclusive			
Viewed HMN	--	--	\$3.07 ^a [\$2.71, \$3.44]
Viewed NON	--	--	\$3.24 ^a [\$2.89, \$3.59]
Viewed COMB	--	--	\$3.34 ^a [\$2.96, \$3.73]
Broadly inclusive			
Viewed HMN	--	--	\$3.75 ^a [\$3.35, \$4.14]
Viewed NON	--	--	\$3.53 ^a [\$3.17, \$3.89]
Viewed COMB	--	--	\$3.92 ^a [\$3.59, \$4.26]

¹ The inclusivity*beneficiary term was not statistically significant in analysis of covariance on attitudes, so attitude scores were not estimated for each beneficiary*inclusivity combination.

² Reference categories for odds ratios are HMN (beneficiary) and less inclusive (inclusivity). The inclusivity*beneficiary term was not statistically significant in logistic regression on decision to donate, so odds ratios were not estimated for each beneficiary*inclusivity combination.

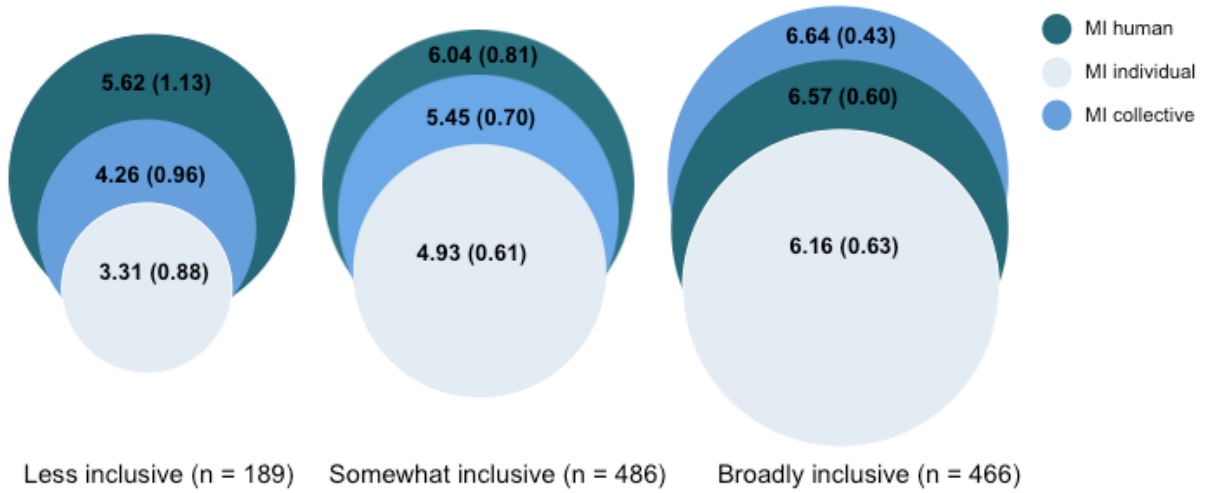


Figure 1. Characterization of clusters resulting from k-means cluster analysis of three moral inclusivity (MI) composite variables (MI human, MI individual, and MI collective). Cluster means (with standard deviations) are reported for each of the composite variables. Circle sizes are scaled to composite means.

Appendix A: Questionnaire

Part 1: Information about respondents

Section 1.1 Background information

1. In the past year I have donated money to an environmental organization. (Yes/No/Unsure)
2. In the past year I have volunteered for an environmental organization. (Yes/No/Unsure)
3. I consider myself an environmentalist. (Yes/No/Unsure)
4. I think nature conservation is important. (Yes/No/Unsure)
5. How do you self-identify politically? (Strongly conservative, Moderately conservative, Slightly conservative, Neutral/centrist, Slightly liberal, Moderately liberal, Strongly liberal, Libertarian, Other)
6. How religious are you? (Not at all religious, Somewhat religious, Very religious, Prefer not to say)

Section 1.2 Social desirability (True/False)

1. It is sometimes hard for me to go on with my work if I am not encouraged.
2. I sometimes feel resentful when I don't get my way.
3. On a few occasions, I have given up doing something because I thought too little of my ability.
4. There have been times when I felt like rebelling against people in authority even though I knew they were right.
5. No matter who I'm talking to, I'm always a good listener.
6. There have been occasions when I took advantage of someone.
7. I'm always willing to admit it when I make a mistake.
8. I sometimes try to get even rather than forgive and forget.
9. I am always courteous, even to people who are disagreeable.
10. I have never been irked when people expressed ideas very different from my own.
11. There have been times when I was quite jealous of the good fortune of others.
12. I am sometimes irritated by people who ask favors of me.
13. I have never deliberately said something that hurt someone's feelings.

Section 1.3 Moral inclusivity (1-7, Strongly Disagree-Strongly Agree. Questions 18 and 19 follow the same response format, with respondents reporting disagreement/agreement to each individual line item a. – q. or a. – m., respectively.)

1. Every person has value above and beyond his or her usefulness for others.
2. In general, I would say human suffering is a moral issue.
3. As a basic principle, people ought to demonstrate respect for other individual people.
4. The wellbeing of an individual animal matters, even if it does not affect the wellbeing of people.
5. Every individual animal possesses a dignity that deserves respect.
6. The wellbeing of individual plants is *not* a matter of moral concern to me.
7. Every plant deserves respect as a living creature.

The following questions will ask you about species. When you see the word “species,” bring to your mind a category of beings. Don’t focus on the individual specimens that make up the species. Instead, think of the species as a distinctive thing with its own properties. Organisms come and go, but a species is continuous. Its past, present, and future is one story.

8. People have a moral obligation to consider how their decisions might harm or benefit a species, even if the species has no apparent use.
9. It makes no sense to talk about respecting a species.
10. When people cause the extinction of a species, they have committed a moral wrong against the species.

In the following questions you will see the word “ecosystem.” When you see this, don’t think so much about the individual organisms that live in an ecosystem. Instead, think of the ecosystem as a whole, a network of interactions and relationships. An ecosystem does have smaller parts, but they are all bound together by flows of matter and energy. Think about these flows, and how they connect to form one system.

11. People have a moral obligation to consider how their decisions might harm or benefit an ecosystem, even if the ecosystem has no apparent use.
12. It makes no sense to talk about respecting an ecosystem.
13. When people cause the loss of an ecosystem, they have committed a moral wrong against the ecosystem.
14. If I had mice nesting in my walls, I would feel some guilt for exterminating them.
15. If I found a spider inside my house, I would hesitate to kill it.
16. If I were weeding a garden, I would feel some remorse for killing the weeds.
17. It is appropriate to feel grateful to the fruits and vegetables we eat.

For the next questions you will see statements with a blank (_____) followed by a list of items. Please read these questions by filling in the blank with each item one by one, marking your response for each individual item. Here’s an example:

“I enjoy reading _____.”

- a. novels
- b. magazines
- c. blogs

For this question you would respond to item a. “I enjoy reading novels,” item b. “I enjoy reading magazines,” and item c. “I enjoy reading blogs” by indicating the extent to which you disagree or agree with each separate statement.

Some of the following questions will again use the word “species.” Like before, when you see this, bring to your mind a category of beings. Don’t focus on the individual organisms that make up the species. Instead, think of the species as a distinctive thing with its own properties.

You will also again see the word “ecosystem.” Just as before, when you see this, don’t think so much about the individual organisms that live in an ecosystem. Instead, think of the ecosystem as a whole, a network of interactions and relationships.

18. If I had to decide whether or not to do something that would harm _____, I would be making a moral decision.

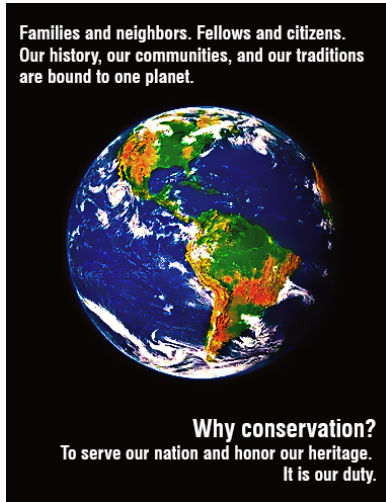
- a. myself
- b. my family
- c. Americans
- d. people in other countries
- e. a dog
- f. a bald eagle
- g. a cow
- h. a cougar
- i. a fly
- j. a houseplant
- k. an oak tree
- l. a fungus
- m. a poison ivy plant
- n. an endangered species of elephant
- o. a local species of mosquito
- p. a tropical rainforest ecosystem
- q. an agricultural ecosystem

19. _____ has value above and beyond any use it may serve for others.

- a. A dog
- b. A bald eagle
- c. A cow
- d. A cougar
- e. A fly
- f. A houseplant
- g. An oak tree
- h. A fungus
- i. A poison ivy plant
- j. An endangered species of elephant
- k. A local species of mosquito
- l. A wild rainforest ecosystem
- m. An agricultural ecosystem

Part 2. Outreach messages manipulating two factors: beneficiary (see main manuscript) and moral foundation (see Appendix B)

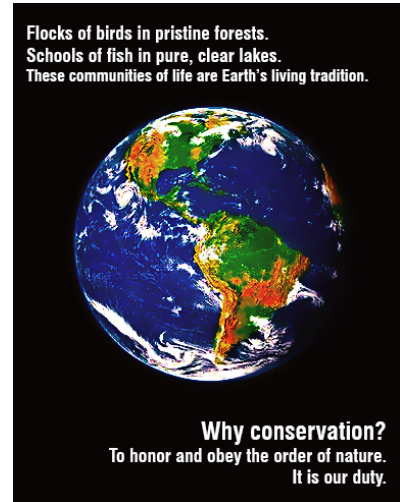
Please consider the following flyer carefully, before answering the questions below it:



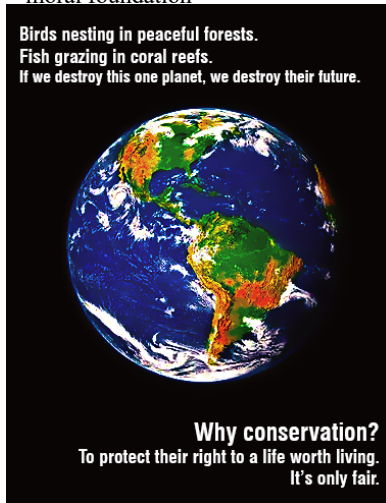
(Above) Human beneficiary, binding moral foundation



(Above) Human beneficiary, individualizing moral foundation



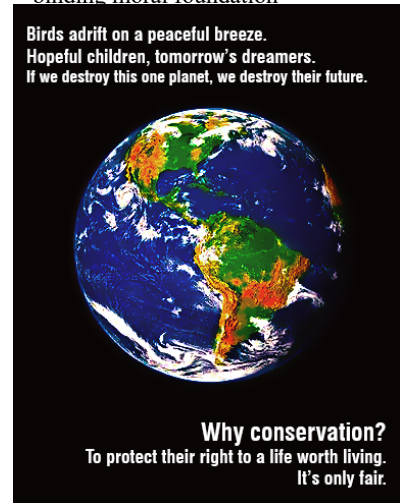
(Above) Nonhuman beneficiary, binding moral foundation



Nonhuman beneficiary, individualizing moral foundation



(Above) combined beneficiaries, binding moral foundation; (below) control



Combined beneficiaries, individualizing moral foundation



Part 3. Response variables

Section 3.1 Attitudes, moral salience, and hypothetical donation (1-7, Strongly Disagree-Strongly Agree, unless otherwise noted)

1. The cause promoted in this flyer is worthy of support.
2. The cause promoted in this flyer is important.
3. I find the message in this flyer persuasive.
4. The message in this flyer makes me think about right and wrong.
5. The message in this flyer makes me think about my moral responsibilities.
6. The message in this flyer reflects my core moral beliefs.
7. If this were an outreach message asking you to support a real conservation organization, would you donate money to that organization right now? (Yes/No)
8. If you answered “yes” to the question above, how much would you be willing to donate? (I would donate \$ _____; I answered “no” to the previous question.)

Section 3.2 Manipulation checks (1-7, Strongly Disagree-Strongly Agree). Respondents viewed the same flyer again at the top of the page before answering these questions.

Here’s the flyer again- just a few more questions about it!

1. This message is about trying to avoid harm.
2. This message is about fairness.
3. This message is about tradition.
4. This message is about community.
5. This message expresses concern for people.
6. This message expresses concern for non-human beings (like animals or plants).
7. I have a strong emotional response to this message.

Section 3.3 Donation

To personally thank you for helping us with this survey we are pleased to pay you \$5 in addition to the normal fee you receive from Qualtrics. In keeping with the spirit of the study and the message you saw above, we would like to give you the opportunity to donate some of this amount to a non-profit organization whose mission is focused on conservation (for example, The Nature Conservancy). If you would like to donate some of your \$5, please indicate how much using the slider below (you are free to donate any amount, from \$0.01 to \$5). Whatever amount you choose not to donate will be emailed to you by the Qualtrics management team. You are also welcome to make no donation and keep the full amount. Like your survey responses, any information entered here will be kept strictly confidential, and no personal or identifiable information will be disclosed to any parties outside the Qualtrics management team.

Section 3.4 Debrief

Thank you again for your participation. At this time we would like to disclose the full objectives of the survey, some of which were withheld from the study description you viewed previously.

The message you saw was one of seven we have used in this study, each carefully crafted to express certain types of moral concern. We are investigating whether different types of moral messages affect whether people donate money to support conservation work. Your decision to donate or not donate some portion of the \$5 (and, if you chose to donate, the amount) will be recorded as data. We *will* donate the amount you entered on the previous page to a conservation organization, and the balance *will* be paid to you via email.

We apologize for the deception, which was necessary to minimize distorting effects that have been observed in past studies, like ours, which investigate persuasive appeals and donation behavior. At this time you have received full information about the study, which was administered with the oversight of the Oregon State University Institutional Review Board to ensure ethical conduct in research with human subjects. While we would greatly appreciate your continuing participation in our study, if you would like to be removed from the sample, you are free to do so at this time by clicking the “Withdraw” button below. If you choose to withdraw, you will still be compensated by Qualtrics, and the additional \$5 will still be distributed between you and a conservation organization in whichever proportions you designated above. To remain in the sample, please click the button marked “Remain in sample.” Thank you again for your time and participation.

Appendix B: Additional Study Information

Second manipulated factor: moral foundation

The results reported in the main paper were part of a broader investigation on morality and persuasive outreach messages for conservation. The beneficiary factor manipulated the types of entities portrayed as objects of moral concern. The second factor, moral foundation, manipulated the types of issues portrayed as matters of moral concern. Recent work in moral and social psychology posits a theory of “moral foundations,” defined as “the psychological ‘foundations’ upon which cultures construct their moralities” (Graham et al., 2011, p. 368). Moral foundations describe the sorts of issues or concerns that are perceived to be “moral” (Graham et al., 2011). Graham et al. (2011) propose two basic clusters of moral foundations. One cluster is comprised of group-oriented norms, including respect for authority, loyalty, and purity; while the other is comprised of more individualistic norms, including care or avoidance of harm and fairness. To incorporate moral foundations into our experimental design, three of the six treatment messages were written to invoke the former “binding” themes, emphasizing community, authority, and tradition; and the other three treatment messages invoke the latter “individualizing” themes, emphasizing fairness, care, and avoidance of harm. Language was drawn from a lexicon of words associated with specific moral foundations, as reported by Graham et al. (2009).

Although humans arguably evolved to recognize and respond to the full suite of moral foundations, each of which served a unique and critical adaptive purpose (Haidt and Joseph, 2004), researchers have found that the relative importance placed on different moral foundations in modern times tends to vary by culture or social group. For example, binding moral foundations often resonate strongly with self-identified conservatives in the U.S., while individualizing moral foundations often resonate strongly with self-identified U.S. liberals (Graham et al., 2009). These associations are not only of theoretical interest, but also have important practical implications. Of particular note are reported effects in persuasive messaging contexts. In experiments similar to the one reported in the main paper, researchers have manipulated outreach messages to place more or less emphasis on different moral foundations or sets of foundations, often finding that the interaction of moral foundation with political orientation explains a significant amount of variation in people’s attitudinal and behavioral responses to treatment messages (e.g., Winterich et al., 2012; Kidwell et al., 2013; Wolsko et al., 2016). To control for these potential effects in analyses reported in the main paper, we included terms for both the moral foundation factor and its interaction with political orientation in statistical models.

Beneficiary manipulation checks

Two items assessed the effectiveness of the beneficiary message manipulations by asking respondents whether the message they viewed conveyed concern for people (item one) and nonhuman beings (item two). In a successful manipulation, mean ratings on item one should have been higher in both the human (HMN) and combined (COMB) message conditions, compared with the nonhuman (NON) message condition, while NON and the control should have been statistically equivalent; and mean ratings on item two should have been higher in both NON and COMB, compared with HMN, while HMN and the control should have been

statistically equivalent. We used Welch's F-test (which is robust to violations of equal error variance between groups) to test for overall differences between beneficiary levels, and Games-Howell post-hoc analysis (which also does not assume equal variance) for subsequent pairwise comparisons. Full results are reported in Table A1.

Relative ratings and patterns of significance on manipulation check items were generally as expected between the three levels of beneficiary (HMN, NON, and COMB). Among individuals who viewed NON, ratings of concern for people were on average 1.44 and 1.33 points lower than ratings from individuals who viewed HMN and COMB, respectively. Mean ratings of concern for people did not differ significantly between HMN and COMB. We observed that the average rating of concern for humans by individuals who viewed NON indicated ambivalence toward the prompt, rather than disagreement *per se*. Still, even if NON did not actively preclude concern for humans, neither did it actively convey concern for humans. We therefore considered the manipulation adequate.

On concern for nonhumans, respondents on average rated HMN 0.96 and 0.76 points lower than NON and COMB, respectively. On average NON was rated 0.21 points higher than COMB on concern for nonhumans, but this difference was only marginally significant ($p = 0.051$). However, we observed that individuals who viewed HMN still generally indicated "agreement" that human beneficiary messages depicted nonhuman beneficiaries (see Table A1). We suggest this rating may reflect an implicit association with conservation, which has historically been affiliated with protection of nonhuman nature. (This also corroborates with our discussion of fluency effects in the Discussion section of the main paper). Although the manipulation was not perfect, the perception of concern for nonhumans was still relatively less pronounced in HMN than NON and COMB. We therefore proceeded with analysis, with the recommendation that future work seeking to replicate our results should strive for cleaner beneficiary manipulations.

Manipulation check ratings for the control message did not follow expected patterns. As expected, mean ratings of concern for people were significantly lower for the control than HMN. However, the control deviated from expectations relative to NON and COMB. The control was rated 1.05 points higher, on average, on concern for people than NON, a statistically significant difference, and the difference between the control and COMB was not statistically significant. Mean ratings of concern for nonhumans were significantly lower for the control than both COMB and NON, as expected. However, on concern for nonhumans the control was rated 0.41 points higher, on average, than HMN, and this difference was statistically significant.

These results suggest the control flyer was not "neutral" on the beneficiary manipulation. In addition to statistical comparisons between the control and the three treatments, mean ratings on both manipulation check items both fell on the "agree" side of the scale, indicating that respondents perceived concern for both humans and nonhumans in the message. We therefore omitted the control from further analysis. Although we lost the ability to compare treatment effects against a no-beneficiary case, comparisons between the three levels of the beneficiary treatment were more pertinent to our main research interests and allowed us to test our hypotheses. Nonetheless, future research should seek to develop a more effective control message. Given the low face validity of a no-beneficiary message (recognizing that conservationists and conservation organizations are unlikely to conduct outreach without invoking any sort of beneficiary), a more viable and informative control may be a no-message condition.

Statistical assumptions

For results of analysis of covariance (ANCOVA) to be valid, certain assumptions must reasonably be met, including assumptions of independence, normality, and equal variance. The assumption of independence was met by virtue of the study design, and the assumption of normality was checked using residual plots and normal probability plots. Although the residuals of attitudes and donation amounts were not normally distributed either between or within groups, ANCOVA is considered generally robust to violations of normality, and the Central Limit Theorem posits normal distribution of the mean, especially for large sample sizes (Ramsey and Schafer, 2013). We also assessed homogeneity of error variance using visual assessment of residual plots and comparison of error variance between groups. In all cases, group sizes did not differ more than fourfold, and error variance did not differ more than tenfold between groups, so the assumption of equal variance was considered to be reasonably met (Tabachnick and Fidell, 2013). Therefore, we proceeded with analysis using standard linear models.

Tables A1 – A5

Table A1. Results of Welch’s F-Tests on beneficiary manipulation check items, followed by Games-Howell post-hoc analyses testing for pairwise differences. For each manipulation check item, non-significant pairwise differences ($p > 0.05$) between human (HMN), nonhuman (NON), combined (COMB), and the control are denoted by shared superscript letters. $N = 1331$

	Mean [95% CI]				df	F	p
	HMN	NON	COMB	Control			
This message conveys concern for...							
<i>people</i>	5.91 ^a [5.78, 6.04]	4.47 ^b [4.28, 4.65]	5.79 ^{a,c} [5.66, 5.93]	5.52 ^c [5.31, 5.72]	3, 626	60.05	< 0.001
<i>nonhuman beings</i>	5.23 ^a [5.06, 5.40]	6.19 ^b [6.08, 6.30]	5.98 ^b [5.87, 6.10]	5.63 ^c [5.44, 5.83]	3, 613	32.46	< 0.001

Table A2. Descriptive information for sample used in analysis. Median age is in the 45-54 year range and median household income is in the \$50,000-\$75,000 bracket. N = 1141

	n	%
Gender		
Male	536	47
Female	605	53
Education		
Less than high school	20	1.8
High school	130	11.4
Some college	236	20.7
Associate's or vocational/technical degree	124	10.8
Bachelor's	369	32.3
Advanced degree	255	22.3
Not specified	7	0.6
Race/ethnicity		
African American	67	5.9
Asian/Asian American	44	3.9
Caucasian	956	83.8
Native American/Inuit/Aleut	8	0.7
Native Hawaiian/Pacific Islander	3	0.3
Other/not specified	63	5.5
Religiosity		
Very religious	291	25.5
Somewhat religious	518	45.4
Not at all religious	327	28.7
Not specified	5	0.4
Political orientation		
Conservative	542	47.5
Centrist	134	11.7
Liberal	445	39
Libertarian/other	20	1.8
Self-identify as environmentalist?		
Yes	483	42.3
No	445	39
Unsure	213	18.7
Nature conservation important?		
Yes	1100	96.4
No	23	2
Unsure	18	1.6

Table A3. Results of analysis of covariance on attitudes. All demographic controls were treated as continuous variables. Moral foundation, the second manipulated factor, was also included as a control variable, along with the interaction of moral foundation and political orientation.

*significant at $p = 0.05$ **significant at $p = 0.01$ ***significant at $p = 0.001$

	df	F	Mean square estimate	p	η_p^2
Beneficiary	2, 997	0.692	0.557	0.50	0.001
Inclusivity	2, 997	205.61	165.59	<0.001***	0.292
Beneficiary x inclusivity	4, 997	1.13	0.91	0.34	0.004
Religiosity	1, 997	1.12	0.90	0.29	0.001
Education	1, 997	5.71	4.60	0.02*	0.006
Age	1, 997	3.61	2.91	0.06	0.004
Income	1, 997	1.26	1.01	0.26	0.001
Political orientation	1, 997	28.74	23.15	<0.001***	0.028
Moral foundation	1, 997	0.90	0.72	0.34	0.001
Moral foundation x political orientation	1, 997	0.80	0.64	0.37	0.001

$R^2 = 0.38$, *adjusted* $R^2 = 0.37$

1 Table A4. Results of logistic regression on decision to donate (main effects model). All
 2 demographic controls were treated as continuous variables. Moral foundation, the second
 3 manipulated factor, was also included as a control variable, along with the interaction of moral
 4 foundation and political orientation. Reference categories for the three terms entered as factors in
 5 the model are human (beneficiary), less inclusive (inclusivity), and individualizing (moral
 6 foundation). *significant at $p = 0.05$ **significant at $p = 0.01$ ***significant at $p = 0.001$
 7

	B	Wald	p	Exp(B) [95% CI]
Beneficiary		7.24	0.03*	
Nonhuman	0.47	6.98	0.01**	1.60 [1.13, 2.27]
Combined	0.30	2.96	0.09	1.35 [0.96, 1.91]
Inclusivity		56.06	<0.001***	
Somewhat inclusive	1.38	46.18	<0.001***	3.98 [2.67, 5.93]
Broadly inclusive	1.47	48.42	<0.001***	4.35 [2.88, 6.58]
Religiosity	0.03	0.09	0.77	1.03 [0.83, 1.28]
Education	0.07	2.51	0.11	1.07 [0.98, 1.16]
Age	0.15	10.43	0.001***	1.17 [1.06, 1.28]
Income	0.10	4.55	0.03*	1.10 [1.01, 1.21]
Political orientation	0.06	1.13	0.29	1.06 [0.96, 1.17]
Moral foundation	0.26	0.81	0.37	1.30 [0.73, 2.31]
Moral foundation x political orientation	0.01	0.01	0.94	1.01 [0.88, 1.15]
<i>Nagelkerke $R^2 = 0.13$, 72.7% correct prediction</i>				

8
9

10 Table A5. Results of analysis of covariance on non-zero donation amounts. All demographic
 11 controls were treated as continuous variables. Moral foundation, the second manipulated factor,
 12 was also included as a control variable, along with the interaction of moral foundation and
 13 political orientation. *significant at $p = 0.05$ **significant at $p = 0.01$ ***significant at $p = 0.001$
 14

	df	F	Mean square estimate	p	η_p^2
Beneficiary	2, 692	3.79	13.66	0.02*	0.011
Inclusivity	2, 692	7.47	26.97	0.001***	0.021
Beneficiary x inclusivity	4, 692	2.49	8.98	0.04*	0.014
Religiosity	1, 692	1.54	5.55	0.22	0.002
Education	1, 692	0.99	3.59	0.32	0.001
Age	1, 692	13.29	47.98	<0.001***	0.019
Income	1, 692	4.50	16.25	0.03*	0.006
Political orientation	1, 692	4.32	15.59	0.04*	0.006
Moral foundation	1, 692	0.20	0.71	0.66	<0.001
Moral foundation x political orientation	1, 692	0.90	3.23	0.34	0.001
<i>R² = 0.09, adjusted R² = 0.07</i>					

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