RESEARCH ARTICLE

Conservation for nature and wildlife's sake: the effects of (non-)anthropocentric ethical justifications on policy acceptability

Lauren Yehle[1] , Patrik Michaelsen[1,2], Niklas Harring[1] and Sverker C. Jagers[1,3]

[1]Department of Political Science, University of Gothenburg, Goteborg, Sweden, [2]Department of Management and Engineering, Division of Economics, Jedi Lab, Linköping University, Linkoping, Sweden and [3]Department of Earth Sciences, Uppsala University, Uppsala, Sweden
Corresponding author: Lauren Yehle; Email: lauren.yehle@gu.se

Abstract
We conduct a survey experiment testing the causal link between ethical justifications and acceptability towards two environmental policies: conservation area expansion and wildlife infrastructure. In a 2×3 experiment with American participants ($n = 1604$), we test two ethical justifications – anthropocentric justification (nature as instrumentally valuable) and a non-anthropocentric justification (nature as intrinsically valuable) compared to a control group. We find partial support that non-anthropocentric justification increases policy acceptability compared to no justification. Contrary to expectations, non-anthropocentric justification leads to higher policy acceptability than anthropocentric justification. These results are robust to individual differences in political orientation and environmental concern. Additionally, participants in the non-anthropocentric experimental condition respond that similar conservation policies generally are, and should be, passed to benefit wildlife and ecosystems compared to control group participants. Likewise, participants given the anthropocentric justification report that similar policies are, and should be, passed for humans and society compared to the control group.

Introduction

Human activities can fragment natural ecosystems and habitats, increasing the challenges affiliated with safeguarding biodiversity and meeting internationally agreed upon commitments (Mace et al. 2014). Meanwhile, people's interest in managing large environmental problems such as biodiversity loss, climate change, and chemical and plastic pollution has expanded to pressure governments to take

action (Fairbrother 2013; Inglehart 2008; Watson et al. 2014). The gap between long-term environmental concern, on one hand, and behavior and attitudes with short term implications, on the other hand, has been extensively researched and can be made sense of as a "social dilemma" (Gifford 2011; Johansson Sevä and Kulin 2018). Social dilemmas are characterized as scenarios where a payoff structure to act selfishly in the short term is higher than the longer-term benefits of everyone having cooperated (Dietz et al. 2002). A third party, like the state, can develop and administer policies to minimize collective action stressors and promote factors facilitating cooperative behavior (Jagers et al. 2020). The state can also coerce people to act against their selfish interests on behalf of mitigating environmental problems (Mansbridge 2014). One potential barrier to state policy implementation is public support, or policy acceptance.

Policy acceptability and acceptance concerns public opinion (Kyselá et al. 2019) unlike social acceptability focusing on the perspectives of key actors and stakeholders within the wider policy process from planning to implementation stages (Busse and Siebert 2018). We focus on public opinion as an important aspect of environmental policy making, especially conservation policies. The likelihood of implementation is at least partially a result of how democratic politicians may hesitate to pass environmental initiatives if they fear losing or maintaining office as a result of unpopular policies (Stein 2022). Furthermore, policies are unlikely to pass without a sufficient degree of policy acceptability, i.e., widespread positive attitudes before implementation (Kyselá et al. 2019). Individual and contextual factors related to the acceptance and acceptability of pro-environmental policies has rapidly expanded in the last few years (Ejelöv and Nilsson 2020), especially for climate policies (Drews and van den Bergh 2016).

However, conservation policy cases have not been as extensively studied, leaving the potential effect of policy justifications on attitudes relatively unknown (Rode et al. 2021). We explore this possibility utilizing two justifications from environmental ethics: (1) anthropocentrism, establishing that nature is only valuable in so far as it instrumentally improves human welfare (e.g., habitats beneficial for ecosystem services or aesthetic purposes), and (2) non-anthropocentrism, asserting that aspects of the natural world are valuable intrinsically (e.g., habitats valuable as functioning systems irrespective of human interests) (Brennan and Lo 2022). We take inspiration from and build upon Rosa and Da Silva's (2005) study of ethical arguments present in the Natura 2000 initiative, a conservation policy to preserve species and habitats in the EU. Rosa and Da Silva (2005) focus on the ethical positions of key stakeholders like environmentalists and economic developers, whereas we examine the effect of similar ethical frameworks on public opinion. Thus, the aim of the study is to investigate if *anthropocentric or non-anthropocentric justification promotes conservation policy acceptability*.

To meet our objectives, we utilized a 2 × 3 survey experiment administered online in April 2024 with a sample of Americans. Though we recognize that there are many aspects that may affect the communication of conservation policies, an experimental design allow us to isolate and manipulate one of many potential causal factors (Shadish et al. 2001). We randomized the policy case (wildlife infrastructure and conservation expansion) and the ethical justification (anthropocentric, non-anthropocentric, and none). Conservation policies are important ends in their own

right to promote biodiversity (Butchart et al. 2012) and provide ecosystem services (Adams 2014). Moreover, as Steinberg (2009) argues, conservation is relevant for the field of policy studies overall; "biodiversity is an illuminating test case for institutional responses to long-term policy problems, because the natural processes at risk (the survival of species and ecosystems) require very long-term social stewardship, the absence of which may produce irreversible losses in social welfare, insofar as these biological resources are valued by society for their inherent worth and for the goods and services they provide." Wildlife corridors and protected land areas, are two such policy solutions that can provide long-term infrastructure for the local species and scales up to larger biodiversity concerns (Allan et al. 2022; Hobbs 1992; Schwab and Zandbergen 2011). Notably, policies like these mentioned have been passed by bipartisan state congresses in a number of American states, indicating that the policies may be less polarizing (Legislature of the State of Florida 2021; Schultz and Hinkins 2020; Will and Danielson 2021) and thus more feasible to isolate the effect of ethical justification in an experimental design (Aguinis and Bradley 2014).

In the remainder of this article, we first review previous literature, followed by our theoretical expectations and hypotheses. Thereafter we present our method, data and operationalizations. We then account for our results and end with a discussion and a concluding section.

Previous research

Land use scholars research attitudes towards conservation policies through the related concept of social acceptability (Busse and Siebert 2018). Social acceptability studies focus on the perspectives of relevant stakeholders like land owners (Tanguay et al. 2021) or farmers (Sattler and Nagel 2010). In depth case studies have established the critical role local communities play in many stages of the policy process, including design and implementation (Dimitrakopoulos et al. 2010; Junge et al. 2009; Rico Garcí-Amado et al. 2013; Schenk et al. 2007; Siebert et al. 2010). Social acceptability, however, captures a partly different aspect of the policy process compared to public opinion, studied by policy acceptance scholars.

Policy acceptance research has expanded significantly in recent years – especially for pro-environmental policies, environmental taxes, and climate policy. A literature review by Ejelov and Nilsson (2020) highlight that left leaning ideology and environmental concern are systematically among the most consistent factors influencing policy support across a range of countries and environmental policy cases. Additionally, political trust reflects an important factor for environmental protection and taxes (Fairbrother 2016). Finally, policy specific beliefs like perceived effectiveness and fairness are amongst the strongest determinants of environmental policy acceptance (Bergquist et al. 2022; Drews and van den Bergh 2016; Ejelöv and Nilsson 2020; Eliasson and Jonsson 2011; Thaller et al. 2023).

We have every reason to believe that environmental policy factors may also matter for conservation policies to some extent, but it is still valuable to differentiate between environmental policies (see Ejelöv et al (2022) for a full rational). Fortunately, scholars have identified some policy acceptance factors emerging from

conservation cases – especially policies related to wildlife management. For example, animal value orientations effect people's attitudes towards wild game consumption in Germany. Relatedly, participants with higher levels of mutualism, i.e., viewing wildlife as capable of trust with humans and as deserving of rights and care have greater support for policies that benefit wildlife (Teel et al. 2007), even at the cost of human interests like economic development and protected area access in Washington state (Dietsch et al. 2016). Furthermore, a shift in higher mutualistic values appears to effect the design of wildlife management policies that rely on public support in a number of countries (van Eeden et al. 2017).

This being said, wildlife management is only a subset of conservation studies and does not account for conservation policies with broader aims to address habitat and biodiversity loss. Faccioli et al (2024) find important distributional effects on the public preferences for which communities receive biodiversity enhancement benefits from the housing development plan of the UK's Net Gain policies. Additionally, Uenal et al (2022) find negative correlations between climate (not conservation) policy benefitting humans, non-humans, and the natural environment and the newly established ecological dominance orientation (EDO) measure. EDO is an extension of the well-established social dominance orientation (SDO), which measures preferences towards hierarchical structures within human society, by measuring the preference for hierarchical arrangements with non-humans and the environment (Uenal et al. 2022).

Recognizing that policy acceptance research regarding conservation is expanding, though still limited, we answer the empirical call from prior environmental policy acceptance studies to investigate policy framing, communication, and justification (Eliasson and Jonsson 2011; de Groot and Schuitema 2012). Framing studies yield mixed results in political judgment generally (Amsalem and Zoizner 2022) and environmental attitudes specifically (Rode et al. 2021). For policy cases like climate change, participants have been arguably been pre-treated by public debate and the media resulting in small, though significant, effects (Bernauer and McGrath 2016). Indeed, no meaningful framing effects are found for many carbon-neutral policies (Poortinga et al. 2023). However, other studies show that framing effects are contingent on political partisanship and content (Feldman and Hart 2018) and personal values (Aasen and Vatn 2018). What is more, communicating certain features of a policy as being fair (Savin et al. 2020; Dechezleprêtre et al. 2022) and omitting negative policy outcomes (Rettig, Gärtner, and Schoen 2023) affects policy acceptance (see also Bergquist et al. 2022). Furthermore, these findings (or lack thereof) seem to be highly case specific as McLean et al (2024) finds that Americans are more willing to accept a natural gas ban when it is framed as a human health concern compared to an environmental or economic issue. Given these mixed and case specific results, this leaves the possibility of framing effects on conservation policies.

One potential conservation frame is policy justification – specifically environmental ethical justification inspired by Rosa and Da Silva's (2005) who identified when and how stakeholders utilized strong and weak anthropocentric, biocentric, and ecocentric justification to argue for the conservation directive Natura 2000. The Natura 2000 initiatives intended to protect natural and semi-natural habitats, concerned with biodiversity at the species and ecosystem level

which they argue was a non-anthropocentric aim but could be framed with other ethical justifications. Notably, stakeholders presented arguments within the context of their opponent's strategies rather than on behalf of deeply held beliefs (e.g., conservationists who held ecocentric beliefs utilizing weak anthropocentric justifications). These stakeholders operate within the realm of politics and public opinion, and thus subscribing to ethical positions that do not reflect basic values may be indefensible long term to the public (Rosa and Da Silva 2005, 123).

This study fills two research gaps. First, we extend policy acceptance methods and concepts, specifically framing and communication, from environmental policy generally to conservation policies specifically. Second, we expand upon Rosa and Da Silva's (2005) work to theorize the ways in which environmental ethical justification may affect policy attitudes.

Theory and hypotheses

Policy acceptance research has been critiqued for weak conceptualizations, causing the studies to be difficult to replicate and theoretically vague (Kyselá et al. 2019). Furthermore, researchers tend to use the terms loosely without a definition especially for land use studies (Busse and Siebert 2018). To provide conceptual clarification, we adopt Kyselá's et al. (2019) definitions, which have been widely adopted by climate policy acceptance scholars (Bergquist et al. 2022; Drews and van den Bergh 2019). From this perspective, policy acceptance and acceptability are manifestations of policy attitudes, referring to the degree by which one favors or disfavors a policy proposal, typically measured through self-reported scales (Bohner and Dickel 2011, 392). Acceptability is the passive evaluative response to a proposal (indicating the potential to accept) whereas acceptance is the passive evaluative response to an existing policy (Kyselá et al. 2019). We understand that this differentiation of policy acceptance and acceptability does not account for specific actors, scale, and degree like Busse and Siebert (2018)'s concept of policy acceptability.

Some have argued that the field of ethics may provide insight for policy makers managing environmental issues (Jonsen and Butler 1975). For environmental ethicists, most problems rest on what moral obligation humans have towards the environment with ramifications for how humans *should* manage the earth's natural resources. Philosophers who argue on behalf of anthropocentrism claim that nature is instrumentally valuable to humans for survival, economic, and/or aesthetic reasons (Brennan and Lo 2022). If this evaluation is sufficient, then governments can harness the same tools and duties typically used to limit human action (Callicott 1984, 299). Others have argued that anthropocentrism does not necessarily lead to environmental degradation and fits within a well-established sustainability ethic (Norton 1984). In contrast, non-anthropocentrists hold that nature is intrinsically valuable in its own right, generating a "prima facie direct moral duty on the part of moral agents to protect or at least refrain from damaging [the environment]" (Brennan and Lo 2022). Non-anthropocentrism includes a range of environmental ethical positions, including biocentrism as referring to animals and plants at the individual and species level and ecocentrism extending rights further to abiotic

elements like minerals and water (McShane 2007; Rosa and Da Silva 2005). Two common approaches to justify non-anthropocentrism are sentientism that animals with awareness, subjectivity, and consciousness deserve moral consideration and/or pathocentrism which expands consideration to species with the capacity to suffer (Gruen and Monsó 2024; Treich 2022).

We have reason to believe that both environmental ethical justifications matter. Norton (1995) argues that non-anthropocentric justifications slow the policy process by alienating anthropocentricists. Thus, one should expect that anthropocentric and non-anthropocentric evaluations of nature gradually converge (Steverson 1995). Indeed, Rosa and da Silva (2005) argue the conservation policy Natura 2000 is "undoubtedly the daughter of weak anthropocentricism" confirming Norton's convergence logic occurred in the directive's argumentation. Meanwhile, Sagoff (1991) and McShane (2007) claim that intrinsically valuing nature will lead to better policy outcomes, because such justification better matches the way the public *feels* towards the environment: "even if anthropocentrism leaves us with good policy recommendations, it will constrain the ways in which we think it makes sense to care about the natural world" (McShane 2007, 178). Although directed to the philosophical debate on whether anthropocentric and non-anthropocentric justifications should be prioritized, these critiques are in fact an empirical question.

It is possible ethical justifications have no measurable effect on the policy process and thus remain primarily an intellectual question. If, on the other hand, the justifications do have an effect, this calls for an examination of how and when politicians or policy makers can or should use ethical justifications to increase policy acceptability. The second of these seems more likely as we know that policy acceptance from, e.g., climate policy (Drews and van den Bergh 2016; Rode et al. 2021) can be affected to various extents by framing and communication. Regardless of which justification is provided, we thus expect that any ethically justified policy will increase policy acceptability compared to a policy proposed without ethical justification.

H1a: *Policy acceptability is higher when the policy is motivated with anthropocentric justification than without ethical justification.*

H1b: *Policy acceptability is higher when the policy is motivated with non-anthropocentric justification than without ethical justification.*

Prior environmental policy studies find mixed or insignificant effects for framing (Pechey et al. 2022; Poortinga et al. 2023; Rode et al. 2021). Bernauer and McGrath (2016) have argued that the participants responding to these policy cases have pre-treatment framing effects. However, this current study pertains to two conservation policy cases not yet used to the authors' knowledge for survey experiments and not as commonly debated in public or covered in the popular media. Thus, we find it plausible to find a detectable difference between the two justifications.

We expect policies that concern humans and society to have precedence over policies that concern non-humans (in this study – wildlife and ecosystems). This could be conceptualized in many ways, e.g., by proceeding from rational choice theory (Hastie and Dawes 2009), i.e., that policies concerning humans align with

human self-interests, or by ingroup/outgroup biases which would suggest that people give preferential treatment to species ingroup compared to inter-species outgroup (Gaertner et al. 1993). Thus, an anthropocentric justification is expected to increase policy acceptability compared to a non-anthropocentric justification.

However, specific environmental policies can have more obvious non-anthropocentric beneficiaries than others. For instance, conservation expansion policies are reasonably more implicitly concerned and linked with nature than infrastructure policies. The non-anthropocentric justification aligns with conservation expansion policies such that this justification will be more effective for the conservation policy case compared to the infrastructure policy case that pertains more with human welfare. Thus, even though we expect an anthropocentric justification which pertains to human interests to elicit more policy acceptability regardless of policy case, this effect will be lower when the policy case is less intuitively about society and people.

H2: *Anthropocentric justification increases policy acceptability compared to non-anthropocentric justification; however, this effect is smaller for the conservation expansion case compared to the wildlife infrastructure case.*

Finally, it should be noted that we expect both cases to garner generally high reported acceptability, especially in a survey. We selected policy cases that are publicly less controversial and indistinctly partisan, compared to other environmental policies, such as climate policy. The two selected policy cases are examples of an American stewardship ethic which has a long history originating in conservatism and republicanism from the 1850s (Shutkin 2001). According to Pew Research Center, most Americans (90% democrats and 52% republicans) believe the country should do "whatever it takes to protect the environment" (Anderson 2017).

However, if there are partisanship effects, democrat identifying participants are expected to be more prone to accept both cases, regardless of justification, because the dependent variable measures the acceptability of pro-environmental expenditure initiated by the state. This follows previous research indicating that left leaning people are more supportive of governmentally initiated environmental policies (Ejelöv and Nilsson 2020). Specifically, in the American context, democrat identifying participants report higher environmental concern and support of a wider range of environmental policies in surveys (DeNicola and Subramaniam 2014; Dunlap 2008).

Methods

We conducted a survey experiment investigating the causal link between policy justifications and policy acceptability. Utilizing two policy cases increases, to some extent, the external validity of the experiment, and we are less likely to analyze spurious effects driven by one exceptional case. The vignettes are based on "actual derived cases" based on American state bills with realistic factors to increase the generalizability of the result (Aguinis and Bradley 2014). The selected policy cases have recently been passed with bipartisan support and contain non-anthropocentric and anthropocentric justifications within the bills' texts.

This study was pre-registered on the open science framework (https://osf.io/pf5dj)[1] and received approval through the Swedish Ethical Review Authority. All participants voluntarily consented to participate in the survey and were compensated for their time. Online surveys are generally more diverse and representative of the US population, though samples may show self-selection biases from boredom or unemployment (Aguinis et al. 2021). The lower accountability associated with an online setting is assumed to result in lower data quality, but this is not borne out by the empirical evidence (Hauser, Paolacci, and Chandler 2019). Prolific panel participants, as used in the present study, are furthermore more likely to pass attention checks, give meaningful answers, and remember previous information and instructions compared to competing panels such as Amazon's Mechanical Turk, the Qualtrics panel, and undergraduate samples (Douglas et al. 2023).

A power analysis showed that a sample of 1440 respondents would reliably detect an effect size of 0.18 (Cohen's d).[2] We recruited 1800 participants assuming that 10–20% would fail the attention checks (Abbey and Meloy 2017). On Prolific, qualification to participate included living in the US and having completed at least 10 prior surveys on the platform with a $\geq$90% approval rating. We attempted to recruit people who were not explicitly interested in environmental questions by advertising the study as concerning "your opinion on public expenditure." All results were collected within 24 hours of releasing the survey in April 2024 with no major relevant events occurring, so we expect limited exogenous effects.

In accordance with the preregistration, the final sample excluded participants who failed a reCAPTCHA bot check (23 entries), failed an instructional attention check to write the word *blue* for the number of children one had (179 participants), or did not answer the primary dependent variable (6 participants). Of the remaining 1604 participants, 50% were female, with an age range of 18–65+ (measured categorically, the most popular response was between 25 and 34 years old). Generally, the participants were liberal, concerned with the environment, highly educated, and lived in urban/suburban locations. Full descriptive statistics are provided in the supplementary materials.

The study consisted of three main parts: (1) a demographics section, including questions about political identification and environmental concern, (2) the experimental task, and (3) outcome measures related to the experimental task.

For the first section, we measured *environmental concern* with the statement: "I am concerned about the environment" (1 = Strongly disagree – 7 = Strongly agree); and level of *intrinsic evaluation of nature* by asking "Which statement better reflects your opinion?" with answers indicated on a 7-point scale "Nature matters mostly in the ways that it can help humans" (1) to "Aspects of nature have value in themselves regardless of humans" (7). *Political orientation* was measured:

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[1]The numbering of the hypotheses was changed between the preregistration and the manuscript (their specifications remain unaltered). Hypothesis 1a and 1b in the manuscript correspond to hypothesis 1 and 2 in the preregistration, as well as hypothesis 2 to hypothesis 3.

[2]This corresponds with 480 participants in each of the three ethical justification justifications required to test our first and second hypotheses, or 240 in each of the six experimental cells by case and justification required to test our final hypothesis. This sample size can reliably detect effect sizes of 0.18 (Cohen's d) with a power at 80% and alpha equal to 0.05 similar to other studies (Mantzari et al. 2022).

"Generally speaking, how do you think of yourself politically?" with the options "Republican," "Democrat," "Independent," "Other," and "No preference." Participants responding with the latter three options were subsequently prompted to select either "Republican" or "Democrat" based on which party they identified more closely with, and their political lean was coded as their orientation for statistical analyses. The demographics section additionally included measures of participants' *sex*, *age*, *education*, *location*, and *income* (see supplementary materials for details). To avoid post-treatment bias, these questions were asked prior to the experimental manipulation.

In the experiment, participants read a vignette which included information about the policy case and an ethical justification treatment. They were then asked to rate the acceptability of implementing a similar policy in their own state. Features of the task were experimentally manipulated in a 2 (policy case) × 3 (policy justification) between-groups design. Regarding policy case, half of the participants were assigned an (1) infrastructure case, based on real bills recently passed in Colorado (*SJR21-021*) and Utah (*HCR 13*), and the other half of participants were provided a (2) conservation case, based on a policy recently passed in Florida (*SB976*). In conjunction with the policy case, participants were further randomized into receiving one of three policy justification treatments: an anthropocentric justification, a non-anthropocentric justification, or no specific justification. To conclude the vignettes, all participants were informed, "These bills have typically passed with bipartisan support," which was true for the previously referenced policies (Legislature of the State of Florida 2021; Schultz and Hinkins 2020; Will and Danielson 2021). See Table 1 for the complete vignettes.

These vignettes were concisely written to make the features of interest salient and to avoid potentially confounding information. Longer treatment texts would furthermore make the active justification treatments less comparable to the control group participants who received less information and thereby required less cognitive effort to complete the survey. Finally, based on pilot studies with students, longer vignettes were associated with lower attention and manipulation check passage; exit interviews with select pilot study participants indicated that the policy cases were relatively intuitive requiring little additional explanation.

The study's main dependent variable was *policy acceptability*. This was measured by a single item asking respondents: "What is your opinion on using the state budget to fund an infrastructure [/conservation] bill of this kind in your state?". Answers were given on a 7-point response scale with endpoints labeled "strongly against" (1) and "strongly in favor" (7).

A comprehension check regarding the information in the experimental task was also posed, which read: "According to the information written on the previous page, what, if anything, did the bill reflect a concern for?". The three available alternatives were: "The well-being of people and society," "The well-being of wildlife and ecosystems," and "There was no explicit information about this." As per the study preregistration, we treated the results of this check as exploratory. A pilot study conducted on Prolific with 159 participants indicated that the check was dissimilarly easy to answer between experimental groups; specifically, participants in the control group (given no justification) were more prone to guess what could have motived the bill rather than respond with the correct answer ("no information provided")

Table 1. Treatment vignettes

Policy Case	
Wildlife Infrastructure	Conservation Expansion
Several states have recently passed infrastructure bills to invest in wild open areas. For instance, funding has been provided for overpass bridges, fencing, and escape ramps, which reduces road collisions and other traffic incidents.	Several states have recently passed conservation bills to invest in wild open areas. For instance, funding has been provided to connect and manage these areas, which increases resiliency against natural disasters and other shocks.

Policy Justification		
Control/no justification	Anthropocentric	Non-Anthropocentric
These bills have typically passed with bipartisan support.	First and foremost, bills like these reflect a commitment to and concern for the well-being of people and society. These bills have typically passed with bipartisan support.	First and foremost, bills like these reflect a commitment to and concern for the well-being of wildlife and ecosystems. These bills have typically passed with bipartisan support.

and therefore failed the check. To exclude participants based on this comprehension check would therefore introduce selection bias from unequal exclusion and thus interfere with the random assignment to experimental treatment. Instead, we conduct the main analyses with the full sample and report sub-group analyses in the supplementary materials. The results are substantively the same when excluding those who failed the comprehension check, except for results pertaining to follow up interaction analysis of H1b which will be discussed below.

Finally, the post-treatment section of the survey also included the following questions. *Perceived justification*: "In general, what do you think the government is most concerned for when passing bills like the one described earlier?", and *Preferred justification*: "In general, what do you think the government should be most concerned for when passing bills like the one described earlier?" Both questions used a 7-point scale where 1 = people and society, 4 = both options equally, and 7 = wildlife and ecosystems.[3]

Results

The effect of providing policy justifications on policy acceptability

We predicted that providing an anthropocentric (H1a) or non-anthropocentric (H1b) policy justification would increase policy acceptability compared to the control condition without a justification. This was tested in a linear regression model, regressing policy acceptability on binary indicator variables for the two justifications with the control group as the reference level. The results showed no support for Hypothesis 1a that an anthropocentric policy justification increased policy acceptability compared to our control condition, $b = -.05$, SE $= .08$, $p =$

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[3]"In general" was underlined in an attempt to clarify for participants that this question pertained to similar policies overall rather than the specific policy case used in the justification.

.54, 95% CI [−.02, .11], $d = .04$. However, in support of Hypothesis 1b, results showed that policy acceptability was higher among participants receiving the non-anthropocentric justification than for participants in the control condition, $b = .18$, SE $= .08$, $p = .03$, 95% CI [.02, .34], $d = .14$.

(In)consistencies across policy case

As stipulated in the preregistration, we investigated the robustness of hypothesis 1 across policy case. Separately for each hypothesis H1a and H1b, we fitted a regression model containing binary indicators for policy justification (coded 0 = control, 1 = non-anthropocentric or anthropocentric justification, respectively), policy case (coded 0 = infrastructure, 1 = conservation), and an interaction term between the two. For both the non-anthropocentric and anthropocentric justification, there were no significant interaction effects, $ps \geq .141$, showing that the effect of each justification (vs. no justification) was consistent across policy case. Statistical significance aside, when considering the raw means (see Table 2), the infrastructure case drove the effect of non-anthropocentric ethical justification compared to control; the difference was not significant for the conservation case. The interaction term became significant when excluding participants who failed the comprehension check, $b = −.46$, SE $= .23$, $p = .04$, 95% CI [−.92, −.01]. The results for non-anthropocentric justification did not change substantively for the subsample compared to the full sample, suggesting the significant interaction was driven by the control group's more extreme values in the subset compared to full sample. The supplementary materials include all analyses with a subsample of those who failed the comprehension check, but they do not yield significantly different primary results and are not interpreted further here.

To test whether anthropocentric justification increased policy acceptability compared to non-anthropocentric justification but with smaller effects for the conservation case (hypothesis 2), we regressed policy acceptability on a binary policy justification variable (coded 0 = anthropocentric justification, 1 = non-anthropocentric justification), a binary indicator for policy case (coded 0 = infrastructure, 1 = conservation), and an interaction term created by multiplying the two indicators. As hinted by the results for hypotheses 1a and 1b, we found that, opposite to our expectation, policy acceptability was lower for participants receiving the anthropocentric policy justification compared to non-anthropocentric justification, $b = .23$, SE $= .08$, $p < .001$, 95% CI [.08, .38], $d = .18$. A regression model with the interaction term returns no significant effect, indicating that the effect of the two policy justifications did not differ depending on policy case, $b = −.08$, SE $= .15$, $p = .56$, 95% CI [−.38, 2.17]. Figure 1 illustrates the results for all hypotheses.

Spillover effects from treatment on general policy perceptions and attitudes
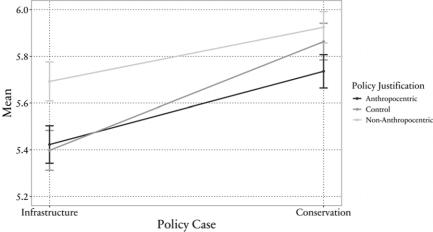
The policy justifications had some spillover effects downstream of the primary dependent variable. A linear regression model shows that, compared to the control group, participants receiving the anthropocentric justification treatment perceived the government as being generally more concerned about "people and society," $b =$

Table 2. Means and standard deviations for *policy acceptability*, separated by policy case and policy justification

Policy Justification Mean (SD)		
Control	Anthropocentric	Non-anthropocentric
5.63 (1.35)	5.58 (1.27)	5.81 (1.23)
n = 527	n = 552	n = 525
Policy Justification Mean (SD), Split by Policy Case					
Infrastructure	Conservation	Infrastructure	Conservation	Infrastructure	Conservation
5.40 (1.39)	5.86 (1.28)	5.42 (1.32)	5.74 (1.20)	5.69 (1.35)	5.92 (1.10)
n = 264	n = 263	n = 272	n = 280	n = 260	n = 265

Figure 1. Mean values of *policy acceptability* with 95% Cis. Average policy acceptability by policy justification and case. Policy acceptability measured: "What is your opinion on using the state budget to fund an infrastructure [/conservation] bill of this kind in your state?" Graph shows non-anthropocentric justification (light gray line) is higher than both anthropocentric justification (dark gray line) and control group (medium gray line) for the infrastructure and conservation policy case. The confidence intervals for the latter two estimates overlap indicating no statistically significant difference, but anthropocentric justification is depicted as lower than control. The conservation policy case has higher means than infrastructure for all policy justifications.

$-.41$, SE $= .10$, $p < .00$, 95% CI [.60, .22]. Correspondingly, participants receiving the non-anthropocentric justification treatment stated they perceived the government as less generally concerned about "people and society," instead prioritizing "wildlife and ecosystems," $b = .55$, SE $= .10$, $p < .00$, 95% CI [.37, .75].

While the results about perceived policy justification may be considered a (successful) manipulation check of the experimental treatments, we found the same pattern regarding what participants thought that governments *should* be concerned

about − that is, their *preferred justification* for similar bills. Compared to control group participants, participants receiving the anthropocentric justification were significantly more likely to state that the government ought to prioritize "people and society," $b = -.23$, SE $= .09$, $p < .01$, 95% CI $[-.41, -.07]$. Similarly, participants receiving the non-anthropocentric justification were significantly more likely to report that the government ought to prioritize "wildlife and ecosystems," $b = .17$, SE $= .09$, $p < .05$, 95% CI $[.00, .34]$). Follow-up analyses show that these effects are further pronounced among participants paying the most attention to the justifications (as indicated by passing the comprehension check; see supplementary materials). Generally, regardless of justification group, the linear predictions show that participants prefer these same bills to be passed on behalf of "wildlife and ecosystems." Graph 2 summarizes these spillover effects (Figure 2).

We ran a series of regressions to estimate whether these policy justification spillover effects were consistent across policy cases. Specifically, we regressed the outcome variable on indicator variables of policy justification, policy case, and an interaction of the two. These analyses showed a significant interaction between non-anthropocentric policy justification (vs. control and conservation case), $b = -.40$, SE $= .20$, $p = .04$, 95% CI $[-.79, -.02]$ (model S.6 in the supplementary materials).[4] This indicates that the infrastructure policy case drove the effect of non-anthropocentric ethical justification compared to no justification on perceived justification of general policies.

Additional analyses

We investigated if the effect of policy justification and policy case differed between subgroups. Table 3 shows summary statistics of the variables.

Regarding political orientation, democrat and republican identifying participants differed in the extent to which they accepted both policy cases, $t(1582) = 9.74$, $p < .001$, $d = .54$. To investigate how the policy justification affected those identifying as democrats v. republicans, we regressed policy acceptability on political orientation as a binary indicator and policy justification as an indicator variable (coded 1 = control, 2 = anthropocentric, 3 = non-anthropocentric), and an interaction of the three – showing no significant interaction of policy justification and political orientation. Second, we regressed policy acceptability on political orientation as a binary indicator and case as a binary variable (coded 0 = infrastructure, 1 = conservation) and an interaction of the two – showing a significant interaction. This is to say, the effect of partisanship interacts with case such that the difference between democrats and republicans was more pronounced for the conservation expansion case compared to the wildlife infrastructure case, $b = .39$, SE $= .14$, $p < .00$, 95% CI $[-.12, .65]$. Complete regression results can be found in supplementary materials (Figure 3).

Finally, we explored associations between policy acceptability and additional factors pertaining to environmental attitudes and demographic factors. Regressing policy acceptability on environmental concern showed higher environmental

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[4]The constant for all these model estimates is around 4 (the neutral option) but see the supplemental materials for specifics.

Perceived and Preferred Justification

What do you think the government is/should be most concerned for...?
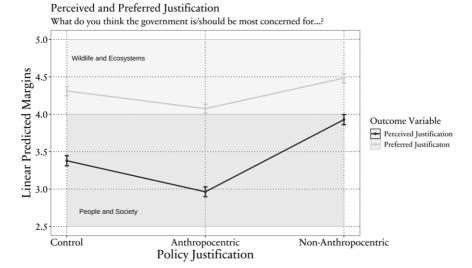

Figure 2. Combined linear predictions of spillover effects with 95% CIs by *policy justification* controlling for *policy case*. Adjusted linear predictions of regressing perceived (dark line) and preferred justification (light line) on policy justification controlling for policy case. Perceived justification measured: "In general, what do you think the government is most concerned for when passing bills like the one described earlier?" Preferred justification measured: "In general, what do you think the government should be most concerned for when passing bills like the one described earlier?" All y-values in the light gray above the value 4 correspond with "wildlife and ecosystems" and all predictions in darker gray below correspond with "people and society." The graph illustrates that compared to the control condition, when given anthropocentric justification, respondents reported answers closer to "people and society" whereas when given the non-anthropocentric justification, respondents reported answers closer to "wildlife and ecosystems." All respondents perceive the bills to be generally concerned more with people and society (dark band) but prefer the bills to be about wildlife and ecosystems (light band) regardless of justification. There are no overlapping confidence intervals indicating meaningful differences.

concern to be associated with increased policy acceptability, $b = .54$, SE $= .03$, $p < .001$, 95% CI [.47, .60]. Likewise, a similar regression model showed that a higher perception of nature's worth as intrinsically valuable was associated with higher policy acceptability, $b = .23$, SE $= .02$, $p < .001$, 95% CI [.19, .27]. Among the demographic information collected in the study, only education showed a significant (positive) association with policy acceptability. However, this correlation was no longer significant upon including environmental concern in the same regression model. See supplementary materials for complete results regarding environmental attitudes and demographic results including interactions with the treatments.
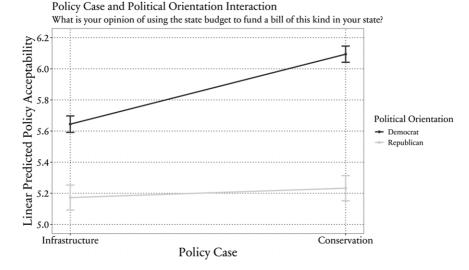
Discussion

We designed a survey experiment to test two hypotheses pertaining to whether anthropocentric and/or non-anthropocentric justification increases policy acceptability. We find no support that anthropocentric justification increases policy

Table 3. Additional variables by policy justification and policy case, mean (s.d.)

		Justification			Case	
	Total	Control	Anthro.	Non-anthro.	Infra.	Cons.
Perceived justification (1 = people and society, 4 = both options equally, 7 = wildlife and ecosystems)	3.41 (1.64)	3.37 (1.61)	2.97 (1.54)	3.93 (1.63)	3.03 (1.58)	3.79 (1.62)
Preferred justification (1 = people and society, 4 = both options equally, 7 = wildlife and ecosystems)	4.29 (1.42)	4.31 (1.4)	4.08 (1.35)	4.48 (1.47)	4.11 (1.34)	4.46 (1.47)
Environmental concern (1 = low, 5 = high)	4.27 (.88)	4.29 (.83)	4.26 (.88)	4.26 (.93)	4.27 (.90)	4.27 (.87)
Intrinsic evaluation (1 = instrumental, 7 = intrinsic)	5.74 (1.53)	5.75 (1.52)	5.75 (1.49)	5.74 (1.55)	5.79 (1.51)	5.70 (1.53)
% (n)						
Political Orientation Democrat	70 (1113)	32 (356)	35 (389)	33 (368)	49 (547)	51 (566)
Republican	30 (471)	35 (165)	33 (156)	32 (150)	50 (237)	50 (234)

20 people were removed from political identification because they did not answer political lean after responding "independent," "other," or "no preference" for political party preference. 5 people did not respond for environmental concern. 6 people did not respond for intrinsic evaluation. 5 did not respond for perceived justification and 4 did not respond for preferred justification. We exclude these participants in analysis.

Figure 3. Adjusted linear predictions of *policy acceptability* with 95% CIs, interaction of *policy case* and *political orientation*. Adjusted linear predictions of regressing policy acceptability on policy case, political orientation, an interaction of both, and controlling for policy justification. It corresponds with model E.M2 in the supplementary materials. Policy acceptability measured: "What is your opinion on using the state budget to fund an infrastructure [/conservation] bill of this kind in your state?" Political orientation measured: "Generally speaking, how do you think of yourself politically?" Graph shows that republicans (light line) have lower support than democrats (dark line) for both policy cases. However, the predicted linear estimates for republicans do not meaningfully differ between the cases whereas for democrats, the conservation case is more acceptable than the infrastructure case. Confidence intervals do not overlap indicating meaningful differences.

acceptability compared to no justification (H1a) or compared to non-anthropocentric justification (H2). We do, however, find support in one of the two policy cases (infrastructure) that non-anthropocentric justification increases policy acceptability compared to no justification (H1b) and, contrary to our expectation, compared to anthropocentric justification (both policy cases). The effect of non-anthropocentric justification held irrespective of demographics (age, location, education, and income), political identification, environmental concern, and intrinsic evaluation of nature indicating that the results may generalize outside the experimental condition.

Additional findings beyond the hypotheses include firstly policy case effects and secondly, treatment effects on measured variables beyond the primary dependent variable of policy acceptability. Regardless of ethical justification, policy acceptability of leaving open spaces undeveloped was higher than building overpasses and fencing to prevent wildlife-vehicular collisions. Those who identified as a democrat with high environmental concern and intrinsic evaluation of nature were especially supportive of the conservation expansion policy case. Also, the policy justification treatment affected what participants preferred the government to prioritize when passing similar conservation policies; those who received the non-anthropocentric justification reported that governments should pass similar conservation policies for wildlife and ecosystems, whereas those who received

the anthropocentric justification preferred policies to prioritize people and society generally.

Our study finds that non-anthropocentric justification promotes policy acceptability compared to anthropocentric justification, especially the wildlife infrastructure policy case. On one hand, this is promising for policy makers who may want to utilize non-anthropocentric argumentation in policy discussions for efficiency or ethical reasons. What is more, many conservation policies, at least in the US, are not as highly polarized as other environmental policies – garnering general support from both parties (Anderson 2017; Funk and Hefferon 2019). Our findings indicate that issues related to conservation policy may be related to ethical considerations not currently reflected in the classic left/right or partisan cleavages. Our study, however, fails to account for powerful interest groups, disproportionately affected people, and key stakeholders who likely hold sway within the policy making process.

Internal study limitations indicate that ethical justifications for conservation policies should be further explored and nuanced. The effects of non-anthropocentric justification may be explained by favorable attitudes towards wildlife, which other scholars have shown are expanding (Dietsch, Teel, and Manfredo 2016). Our study treatment ("passed on behalf of wildlife and ecosystem") does not systematically delineate the different forms of non-anthropocentrism, i.e., respondents may have responded favorably to policies passed on behalf of the wildlife but care less about ecosystems perhaps because wildlife is intuitively more sentient than ecosystems. An additional issue was relatively lower comprehension check passage for participants given no justification and/or the conservation case. This may be explained by especially short vignettes with brief explanations of the policy cases. We suggest a replication of this experimental design with stronger treatments targeting specific forms of non-anthropocentrism to include perhaps symbols, visualization, and/or videos (for example images of roadkill for biocentrism or habitats destroyed by human development for ecocentrism). Such a design might increase comprehension check passage and better account for specific types of non-anthropocentrism.

Because this was an experiment with random assignment, the differences between experimental groups do not depend on participants' characteristics. However, individual characteristics like political partisanship (Feldman and Hart 2018) and personal values (Aasen and Vatn 2018) likely influence conservation policy acceptability and may interact with ethical justification. Additionally, political trust, specifically whether respondents believe the agent (in this case the government) has the competence to implement policies on behalf of anthropocentric or non-anthropocentric entities, likely influences how respondents interpret the agent's justification (Rydén et al. 2024). Political trust also affects attitudes towards environmental expenditure (Fairbrother 2016) and willingness to make economic sacrifices for the environment (Harring 2013). Contextual factors like social norms, specifically whether the message comes from an ingroup or outgroup likely matters as well (Cole et al. 2022). Further studies should examine if our experimental finding about non-anthropocentric justification has meaningful external validity by investigating who this justification specifically impacts and under which circumstances.

These results may not generalize to all contexts outside the survey condition. Even though the Prolific platform consists of a more diverse group of people compared to student samples (Douglas et al. 2023), our sample was overrepresented by more educated, democrat identifying, and (sub)urban participants than the general American public. To what extent these characteristics may limit the generalizability of the present findings needs future investigation. Additionally, these results are based on a sample of US participants that likely will not hold in other cultures and countries with different relationships with nature. Future research should replicate this study on more representative samples and expand to contexts outside the US.

Conclusion

This study contributes to the policy acceptance literature by introducing a new framing factor – non-anthropocentric ethical justification of conservation policy proposals. Survey participants who received a vignette claiming that protected area expansion or wildlife infrastructure policies were passed on behalf of "wildlife and ecosystems" reported higher policy acceptability and perceptions that policies should be passed on behalf of those non-anthropocentric entities. Unexpectantly, participants who were not given a justification or told the policies were passed on behalf of "humans and society" did not reveal similar or as favorable attitudes.

Non-anthropocentric and anthropocentric rationales are already being adopted by policy makers like those who passed wildlife infrastructure bills in Utah and Colorado and conservation expansion initiatives in Florida. Our results indicate that the environmental ethical justifications appear to influence attitudes towards conservation policies. Such findings indicate that policy makers and governments might be able to directly justify conservation policies on behalf of non-anthropocentrism rather than reformulating the policy's aim into anthropocentrism. Norton and fellow pragmatists once argued that anthropocentric arguments would expedite policy making because these justifications would lead to similar enough environmental outcomes without alienating those who primarily valued nature for instrumental human reasons (Norton 1995). However, this study indicates that the public might be more accepting of policies passed on behalf of nature, and thus, to utilize anthropocentric justifications for policies with obvious conservation aims may not be necessary to garner public support.

Despite sampling and case selection limitations, we believe our study establishes how non-anthropocentric ethical justifications could influence public opinion towards conservation policies, warranting consideration and further research. Also, further research should examine to what extent public support for these policies may not necessarily lead to policy implementation due to resistance by key interest groups and stakeholders. We suggest future research can extend the present design to include more policy cases and treatments that could differentiate perspectives within non-anthropocentrism such as biocentrism from ecocentrism and pathocentric from sentientist.

Supplementary material. The supplementary material for this article can be found at https://doi.org/10.1017/S0143814X24000266.

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