



GÖTEBORGS  
UNIVERSITET

DEPARTMENT OF POLITICAL SCIENCE

# CARRY ON WITH CARRION?

A wildlife road infrastructure study regarding the effects of ethical justification on policy acceptance

*Lauren L. Yehle*

---

Master's Thesis: 30 credits

Master's Programme in Political Science: Environmental Governance and

Programme: Behavior

Date: 23 May 2023

Supervisor: Niklas Harring and Sverker Jagers

Words: 17561

## **Abstract:**

Policy acceptance is an important aspect of compliance and government effectiveness. Political science and psychology researchers have attempted to understand policy acceptance through individual and contextual factors but still cannot explain all attitudinal differences. Acceptance of environmental policy is especially important because of the acuteness of environmental concerns and previous and/or potential resistance to unpopular environmental policies. Borrowing concepts from ethical philosophers, I examine if policy justification affects policy acceptance. According Norton (1991), the policy recommendation is expected to be the same whether aspects of nature are intrinsically valued or not, but it is better to use anthropocentric arguments for practical policy reasons. However, if public policy acceptance changes depending on how the policy is justified, then there may be good reason to abandon Norton's argument to make policies that better reflect how humans value the environment. These theoretical ideas inspired testing a new policy acceptance indicator using data collected from an online survey experiment based on a wildlife infrastructure bill passed in Colorado USA. In line with prediction, this study found statistically significant effects of policy justification on policy acceptability and some differing effects for anthropocentric versus non-anthropocentric policy justifications (N=691). These findings contribute to policy acceptance literature, empirically tests philosophical ideas, and provides practical contributions to biodiversity and conservation policy. These findings warrant further research into ethical justifications and policy acceptance in the environmental field and other collective action policy.

**Keywords:** policy acceptance, environmental ethics, intrinsic value, ecosystem services, conservation

**Acknowledgements:** Thank you to both my advisors, Patrik Michaelsen for essential help with survey distribution, and Frederik Pfeiffer for final feedback and friendship. Personal thanks to my partner and *enda vän* Attila Jervelycke, my sister Delaney Yehle, and my dear friends and colleagues Mikaela Kristensson and Cornelia Lindgren. Finally, I am in debt to the Colorado Rocky Mountains for my deeply held awe, respect, and love of nature. FAAFO

## Table of Contents

<i>Abstract:</i> .....	1
<i>Introduction:</i> .....	5
<i>Previous Research:</i> .....	7
<b>Policy Acceptance:</b> .....	7
<b>Environmental Ethics:</b> .....	13
<b>Research Gap:</b> .....	14
<i>Research Aim:</i> .....	15
<i>Theory and Hypotheses:</i> .....	15
<i>Case:</i> .....	18
<b>Possible confounder: Partisanship</b> .....	21
<i>Method:</i> .....	22
<b>Research Design:</b> .....	22
Statistical Analysis: .....	23
<b>Pilot Studies:</b> .....	24
<b>Survey distribution and procedure:</b> .....	25
<b>Operationalization of concepts:</b> .....	26
<i>Data:</i> .....	31
<i>Results:</i> .....	34
<i>Discussion:</i> .....	39
<b>Study limitations:</b> .....	40
<i>Conclusion:</i> .....	41
<i>Works Cited:</i> .....	43
<i>Appendices:</i> .....	51
<b>Colorado Bill: Senate Joint Resolution 21-021</b> .....	51

<b>Qualtrics Survey April 2023.....</b>	<b>55</b>
<b>Summary Statistics of Demographics.....</b>	<b>58</b>
<b>Normality Checks for Dependent Variables.....</b>	<b>60</b>

## **Table of Figures**

Figure 1: Elaboration of Theoretical Model .....	16
Figure 2: Mean estimation of policy acceptability.....	33
Figure 3: Mean estimation of policy prioritization.....	33

## **Table of Tables**

Table 1: Experimental groups and treatment .....	27
Table 2: Treatment coding .....	28
Table 3: Randomization Control.....	32
Table 4: Mean estimation of Dependent Variables.....	33
Table 5: t-test Results for all Dependent Variables .....	35
Table 6: Linear Regression Results .....	38
Table 7: Summary Statistics .....	58
Table 8: results from Shapiro Wilk test and Skewness and Kurtosis Test .....	60

## **Introduction:**

As human activities destroy habitats, natural ecosystems fragment which makes it more difficult to maintain biodiversity and meet international biodiversity commitments (Mace et al. 2014). There is increasing individual interest in preventing and mitigating large environmental problems like biodiversity loss, climate change, and chemical and plastic pollutions (Inglehart 2008; Watson et al. 2014). The gap between environmental concern, on one hand, and behavior and attitudes, 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 long-term benefits of everyone having cooperated (Dietz et al. 2002). A third party, like the state, may develop and administer a set of institutions to minimize collective action stressors and promote collective action facilitators (Jagers et al. 2020). The state may also coerce people to act against their selfish interests on behalf of mitigating environmental problems and protecting the natural world (Mansbridge 2014a).

Preventing livestock from overgrazing a shared field is the traditional environmental social dilemma (Hardin 1968). While grazing land may have clear boundaries, wildlife lacks stationarity and ease of storage (Becker and Ostrom 1995, 115; Wilson 2002). In addition to such containment issues, it is harder to assess the economic or welfare worth of larger ecosystems and biodiversity areas making wildlife preservation sites more susceptible to desecration (Becker and Ostrom 1995, 115). Biodiversity concerns specifically require long term policy solutions that create institutions which “mobilize a bias for social wellbeing on the time scales that far exceed the day-to-day calculus of people going about their daily lives” (Steinberg 2009, 77).

Public support legitimizes the government by increasing compliance; this, in turn, makes the policy more effective (Matti 2015). What’s more, democratic politicians may struggle to pass environmental initiatives if they fear losing office as a result of ineffective or unpopular policies (Stein 2022). Well-founded environmental policies do not get passed without acceptability, i.e., support before implementation; and even if they are widely popular before implementation, the policy will not be effective without acceptance, i.e., support after implementation (Kyselá, Ščasný, and Zvěřinová 2019; Maestre-Andrés, Drews, and van den Bergh 2019).

Given the importance of policy support, many interdisciplinary researchers—primarily from political science and psychology—have attempted to understand who or what promotes

policy acceptance through individual factors (Bergquist et al. 2022; Ejelöv and Nilsson 2020; Harring, Jagers, and Matti 2017) and contextual factors (Harring 2016; Smith and Mayer 2018; Tam and Chan 2018). Other research projects pertain to how the policy is framed (Aasen and Vatn 2018; Nilsson, Hansla, et al. 2016) and the type of policy (Ejelöv et al. 2022; Eliasson and Jonsson 2011; Feinberg and Willer 2013).

Despite this work, no known studies have examined the effects of ethical justification on policy acceptance. Understanding whether people react differently to policy justifications may contribute to our understanding of policy acceptance and more broadly to how democratic governments can solve environmental and collective problems. According to Niebuhr (2013), “The realm of politics is a twilight zone where ethical and technical issues meet” (171). Environmental policy is an especially good example of this twilight zone; competing technical solutions for problems such as climate change and biodiversity loss face additional ethical dilemmas. Some work regarding policy justifications has been examined by public health researchers (Mastroianni, Kahn, and Kass 2019) but these findings are limited to human welfare instead of potential environmental ethical considerations.

I fill this gap in the environmental policy acceptance research by introducing key concepts from ethical philosophers. Environmental ethical justifications are based on the notion that once an object has moral standing, it is owed some moral considerations (McShane 2007a). Anthropocentrists argue that nature is only valuable in so far as it instrumentally improves human welfare or experience; whereas non-anthropocentrists argue that aspects of the natural world are valuable intrinsically (Brennan and Lo 2022). Norton (1995) argues that if the same environmental policy can be expressed in anthropocentric terms as non-anthropocentric terms, then it is more pragmatic to adopt anthropocentric terms (Steverson 1995). Norton assumes non-anthropocentric arguments waste time because it is allegedly easier to promote environmental policies with anthropocentrism. Policies that are passed sooner rather than later would help humanity better curtail environmental catastrophe like biodiversity loss, climate change, loss of essential habitats, etc. (Light and Katz 1996).

Historically, anthropocentric arguments have helped governments pass environmental policy. For example, in 1975, the US’ Environmental Protection Agency (EPA) classified the pesticide DDT as a human carcinogen in order to limit its use, even though it was actually killing wildlife. The EPA argued that the death of pelicans was enough to show it may harm humans and

therefore was worth regulating. However, Rachel Carson's book *Silent Spring* (1962) contributed to a cultural shift of the perceptions of synthetic pesticides and their negative effects on the environment (Lipske 1999). So, when the EPA limited DDT for human health, i.e., an anthropocentric justification, people may have been more than willing to support it for the wildlife loss, i.e., a non-anthropocentric justification (Sagoff 1991). Following Norton's logic, if DDT being labeled as a human carcinogen contributed to the speed and efficiency of DDT regulation, it would have been fruitless and potentially detrimental to argue for the intrinsic value of the saved wildlife because the recommendation and policy outcome were the same.

In this study, I conduct an online experimental survey in the USA examining the policy acceptability of wildlife infrastructure based on a bill passed in the American state of Colorado in 2021. Using vignette survey methodology, treatment groups were exposed to anthropocentric and non-anthropocentric justifications from the Colorado bill's text to examine the effects on policy acceptability. Wildlife infrastructure is a valid non-anthropocentric policy example of environmental spending. As Steinberg (2009) argues, "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" (62). Wildlife corridors and fencing are such policy solutions that provide long term infrastructure for the specific local species and scales up to larger biodiversity concerns.

First, in the previous research section, I present how key concepts from ethical philosophy help fill a research gap in policy acceptance literature. Then, I offer my research aims and theorize hypotheses to satisfy this aim. Next, I explain my policy case and how it has been carefully selected to test my hypotheses. In the methods section, I detail my research design, pilot studies, and statistical analysis. Afterwards, I present my descriptive and analytical results and discuss the findings. I conclude with limitations, implications, and avenues for future research.

## **Previous Research:**

### Policy Acceptance:

Mansbridge (2014b) argues it is the very task of present-day social science researchers to uncover how and by what means to coerce people to act against their self-interest for the collective.

Coercion largely relies on public support for efficient, long-term compliance (Matti 2015). Compliance is a social dilemma in that people have the choice to either comply against their short-term self-interests with higher costs, potentially feeling like a dunce if many others do not comply. Or with widespread compliance, long term benefits for the whole exceed the short-term interests. Researchers characterize large scale collective action by increases in complexity, heterogeneity, and anonymity (Jagers et al. 2020).

Lack of broad political support prevents effective implementation of environmental policies because policy and government intervention are not merely a top-down coercive rule but a long-term series of self-enforcing agreements (Davidovic, Haring, and Jagers 2020; Drews and van den Bergh 2016; Sjöstedt 2014). A suboptimal equilibrium can emerge between the government and public in the case of unfair, unclear, or improperly implemented policy because the public may not trust that other members of the public are following the rules. In response, the government can either pay greatly for compliance in order to punish many non-complying individuals, or it can shirk its responsibility as a policy implementor (Davidovic, Haring, and Jagers 2020, 677; Smith and Mayer 2018, 142). Having broad support with many involved stakeholders can lead to higher initial compliance whereupon the government can more cheaply and efficiently implement and monitor the rules and show effectiveness (Matti 2015). This widescale support should lead to the optimal outcome of high enforcement by the government and high compliance by the public (Sjöstedt 2014). Therefore, it is of essential importance to understand policy support and acceptance.

#### *Environmental Policy Types and Design:*

Policy instruments to address environmental problems are often regulatory whereby the government harnesses a command-and-control tactic (Peters, Pierre, and Knill 2006). This is the primary way governments have regulated the process or production of negative environmental effects like pollutants and chemicals. This top-down approach of environmental regulation has been emerging since the industrial revolution to handle negative externalities of business (Peters, Pierre, and Knill 2006). However, this approach struggles to address other environmental problems like nature conservation and climate change mitigation and adaptation efforts. These latter problems often require softer, bottom-up approaches that steer the public towards preferable environmental behavior and outcomes. These policy instruments include environmental taxes, fines, and education/information campaigns (Ejelöv et al. 2022). The importance of policy



acceptance is essential for these latter policies because of required widescale compliance where more people act against their self-interests (Mansbridge 2014a).

Researchers have attempted to cluster policies as push, pull, or informative to make findings more generalizable (Ejelöv et al. 2022). Pull measures provide government subsidies in the market for desirable behaviors; push measures discourage undesirable behavior by increasing disadvantages of the behavior via regulatory and market-based initiatives; information policies regard requirements like eco-labeling (Ejelöv et al. 2022). Findings seem to indicate that information policies are generally the most acceptable, and framing policies as push rather than pull promotes policy acceptance (de Groot and Schuitema 2012). However, Ejelöv et al. (2022) problematize these categories because measuring attitudes towards one specific policy, for example a carbon tax, does not necessarily generalize to predict support for a similar policy, like an energy tax. It is unclear how my study would classify as push, pull, or informative.

To investigate push and pull policies, researchers often use traffic and road pricing policies as the policy case (Eriksson, Garvill, and Nordlund 2008; Grisolia, López, and Ortúzar 2015; Kim et al. 2013). I contribute to and borrow from some of these findings because my case involves road infrastructure and operationalizes policy attitudes with road tolls for one dependent variable. Road tolls can demotivate driving and minimize private carbon emissions. In this case, a road toll or government spending from public taxes would fund the wildlife corridor in order to minimize habitat and species loss. As the policy does not intend to push or pull people's individual behaviors, high policy acceptance is an indication of environmental or conservation prioritization. Research within this policy case of environmental spending and conservation efforts is quite limited.

Regardless of policy type, the way the policy is designed and implemented effects how individuals perceive policy impacts and fairness. People are willing to accept policies if they believe it will have a positive impact on the environment, even if this has some negative impact on their personal circumstances (Ejelöv and Nilsson 2020). What's more, the most important determinant in positive attitude changes before and after policy implementation was belief about the charge's effects (Eliasson and Jonsson 2011). Another important policy factor is perceived fairness. Fairness seems to be one of the most important determinants for acceptability of road pricing, environmental taxes, and climate taxes and laws (Bergquist et al. 2022; Eriksson et al. 2008; Kim et al. 2013; Nilsson, Schuitema, et al. 2016). Of 15 determinants, distributional fairness was even more important than effectiveness which Bergquist et al. (2022) argue may be why

resistance against climate policy like the 2018 French protests are strongest when policies only account for pure economic efficiency rather than distributing policy impacts.

Perceived restriction of freedom is another noteworthy policy design factor that interacts with effectiveness, personal impacts, and fairness. Policies that restrict people's freedom are generally less popular and the extent to which people accept this restriction is shaped by political ideology (Jagers, Haring, and Matti 2018). However, people are willing to restrict their freedom and choices if the policy is effective and fair (Nilsson, Schuitema, et al. 2016). These policy design characteristics as push, pull, or informative and perceived policy impacts as fair, effectiveness, and restricting freedom do not explain all variance in attitudes, so researchers have turned to individual and contextual factors.

#### *Individual Factors:*

Studies indicate that individual factors have some influence on environmental policy acceptance. Many of these indicators moderate or influence the fairness and effectiveness indicators explained above. Based on a meta-study by Ejelöv and Nilsson (2020), income, gender, and age have little explanatory power.

Ideology is one of the most researched individual policy acceptance factors because of the way environmental questions are politicized in different sociopolitical contexts. Studies indicate left leaning people support more environmental policies of all kinds, but this is specifically mediated by the concept of fairness with a larger effect for people on the left (Jagers, Haring, and Matti 2018) and influenced by contextual factors (Haring, Jagers, and Matti 2019). Ideology or political orientation findings may also be complicated and exaggerated by the vagueness and lack of consistency of the left/right scale (Kulin and Johansson Sevä 2019). Furthermore, many studies utilizing public opinion surveys rely heavily on American samples where many environmental problems are relatively more partisan; whereas in much of the world, environmental issues are not politicized the same way (Fairbrother 2016).

Another individual factor researchers attempt to measure is personal values, defined as guiding principles in one's life across situations, which have mixed impact on policy acceptance (Nilsson, Hansla, et al. 2016, 177). Based on psychology researcher Schwartz' (1992) value orientations, people with transcendence or biospheric values tend to have greater support for environmental policies (Ejelöv and Nilsson 2020). Following Schwartz' logic, Haring and Jagers (2013) confirm a hierarchical values-beliefs-norms (VBN) psychology chain where people's

values, attitudes, awareness of consequence, and personal norms are factors important to understanding the acceptance of increasing carbon taxes. However, personal values alone have little explanatory effect on attitudinal change before and after policy implementation (Nilsson, Schuitema, et al. 2016) nor increase policy acceptance when matching policy framing to personal values (Nilsson, Hansla, et al. 2016). Perhaps instead as Harring et al. (2017) suggest, personal values are better understood as a way to understand how much one is willing to restrict their own interests for the environment.

Because of the mixed results of personal values, researchers have examined the effects of having high environmental or climate change concern (Ejelöv and Nilsson 2020; Eliasson and Jonsson 2011; Fairbrother 2016). However, numerous studies identify a gap between environmental concern and pro-environmental behavior (Gifford 2011); this finding is supported in policy acceptance where it seems lack of high commitment to protecting the environment is more widespread among those who are highly concerned than those who are not (Johansson Sevä and Kulin 2018).

For political science and collective action researchers, trust is an important potential policy acceptance factor (Cook and State 2017; Dietz et al. 2002; Jagers et al. 2020). Regarding horizontal trust, e.g., trust in each other, Fairbrother (2016) finds that people who are more trusting are more supportive of environmental protection, and this is not because these people have higher environmental concern. Harring (2013) finds that individual political trust increases people's willingness to make economic sacrifices. Political trust makes people more likely to support environmental taxes (Fairbrother, Johansson Sevä, and Kulin 2019) and less likely to choose fines (Harring 2016). Harring and Jagers (2013) argue that in addition to personal factors, the degree to which people trust each other and especially their politicians are important factors in understanding environmental policy acceptance. How trust interacts with institutions and social norms requires more study but undoubtedly effects policy acceptance.

#### *Contextual Factors:*

Contextual factors like social norms, trust, wider economic, political and geographic aspects, and communication have effects on policy acceptance (Drews and van den Bergh 2016). One of the most important contextual factors is quality of government (QoG) because of how it may limit effective policy implementation. Low QoG characterized by high corruption, weak rule of law, and low bureaucratic capacity has been shown to contribute to lower environmental

outcomes, because these governments cannot effectively adopt and implement policies (Povitkina and Matti 2021). QoG also interacts with individual factors like environmental concern, trust, and ideology. People with high levels of environmental concern living in high QoG countries are more willing than low QoG residents with similar levels of concern to pay environmental taxes (Davidovic, Harring, and Jagers 2020). Harring (2016) argues political trust findings are closely tied to QoG because low QoG is correlated with low social trust and an urge to punish free riders.

Additional contextual indicators like political culture and economic dependency reinforce the effect of individual factors. For example, Harring et al. (2019) find in a comparative study of carbon taxes in Sweden, Norway, New Zealand, and Australia that economic dependency on climate industries make people less likely to support climate taxes and the effect of political ideology is sensitive to the socioeconomic context. These comparative studies are quite limited but provide interesting explanatory insight as to why some countries succeed in passing and implementing policies when other countries fail.

Other contextual factors are social norms and policy framing. There are two types of social norms: injunctive, what you should or should not do, and descriptive, what other people are doing (Bergquist and Nilsson 2016) and some limited studies have attempted to study social norms as another contextual factor that may influence policy acceptance. Aasen and Vatn's (2018) study framed a petroleum tax increase as an individual effect (to reduce local air pollution) or social effect (to avoid climate change) and found that the individual messaging was more effective than the social messaging, moderated by individual values. Participants' policy support closer matches their peers when participants are informed of their peers' perceptions. They argue this is because the context of information may activate a descriptive social norm. Though not specifically about social norms, in further support of framing policies, Eliasson and Jonsson suggest, "many people are ready to suffer inconvenience or increased costs for the environment, while much fewer are prepared to suffer to achieve a more economically efficient use of scarce road capacity. If congestion charges are marketed only in the latter way, then it seems unlikely that they will get sufficient public support" (646). However, this suggestion was not the focus of their study and has never been empirically investigated or fully understood. Further research should explore the effects of framing and social norms and how they interact with socio-economic conditions.

To conclude the policy acceptance previous literature, policy design and implementation have high effect on policy acceptance as measured by perceived effectiveness, fairness, and

impact. Additionally, individual factors like ideology, personal values, and trust provide some explanation for policy attitudes. Finally, contextual factors like quality of governance, social norms, and economic conditions are still relevant. All together these factors do not explain all policy acceptance variance, and I attempt to identify a new policy acceptance indicator as inspired by philosophers.

#### Environmental Ethics:

Thus far, psychologists and political scientists have studied policy acceptance, but none of these researchers have examined ethical justifications. Jonsen and Butler (1975) argue the gap between ethics and policy making is largely due to how philosophers work in ideal and abstract types with academic jargon that cannot be used by politicians or policy makers who represent a variety of constituencies. This gap has led to a situation where politicians avoid discussions of ethics, and ethical philosophers have removed themselves from public space for more “speculative realms of moral philosophy” (Jonsen and Butler 1975, 19). However, for difficult policy problems like the environment, the field of ethics may provide helpful insight for policy makers which is where I borrow key concepts and find inspiration for this study. For ethical philosophers, a debate about nature’s intrinsic and/or instrumental worth has taken many forms and divisions; I do not argue on behalf of instrumental, anthropocentric or intrinsic, non-anthropocentric valuations of nature. Rather, I empirically test the effects of these ethical justifications on policy acceptance.

The crux of the question for environmental ethicists rests on what moral obligation humans have towards the environment with ramifications for how humans should conserve, use, and manage the earth’s natural resources. The answer typically falls into one of two camps. The first camp, called anthropocentrism, argues that nature is instrumentally valuable to humans. If this evaluation is sufficient, then governments can harness the same tools and duties typically used to limit human action (Callicott 1984, 299). Humans may value nature for survival, economic, or aesthetic reasons, and those human interests provide the justifications to protect and manage the natural world (Brennan and Lo 2022). Anthropocentrists often concern themselves with environmental justice questions like safe minimum standards of what humans can harvest fairly before encroaching on the rights of current or future humans without equal access to the same resources (Barry 1999). Many have strongly argued that this anthropocentrism, or weak anthropocentrism, does not necessarily lead to environmental degradation and fits within a well-established sustainability ethic (Norton 1984).

The second camp, non-anthropocentrism, is best understood from Richard Routley/Sylvan's thought experiment "The Last Man." As the last person on the planet who will soon die, you have the option to destroy one Redwood, a type of tree. This tree cannot provide you with the means to survive—no food, no warmth, no shelter. If there is anything *wrong* with destroying the Redwood, then the Redwood has some sort of intrinsic value beyond its instrumental use to humans who are soon to be extinct (Willott and Schmidtz, 2002). Non-anthropocentrists hold that nature is intrinsically valuable in its own right which generates a "prima facie direct moral duty on the part of moral agents to protect or at least refrain from damaging it" (Brennan and Lo 2022).

For non-anthropocentrists, the parameters of what categorically counts as nature changes the behaviors and duties. At the largest scale, ecocentrists or deep ecologists like Arne Naess (2008) argue that unwarranted separation between the human self and natural world has led to degradation; to harm the ecosystem is to harm ourselves. Scaling down to the biospheric level are land ethicists like Leopold (1968); "a thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community; it is wrong when it tends otherwise" (242); this leads ethicists to argue for wholes like species and habitats but may not include abiotic entities like rocks and rivers. Lastly, animal rights ethicists like Singer (1975) argue for the individual organism level, but critics argue that this level may justify further desecration of the natural community which would place animal rights ethicists outside environmental ethics discussions (Sagoff 1984).

#### Research Gap:

Previous research on policy acceptance provides insight about individual and contextual factors but these factors combined fail to explain all variance in policy attitudes (Bergquist et al. 2022). Ethical justification may be one contributing factor that has not been properly explored or isolated. This factor provides a new philosophical perspective to the policy acceptance literature with timely implications for wildlife policies and preservation.

This study pertains to environmental policy and the ethical orientations we may want to take towards the environment in which we live. Ethical philosophers attempt to do this, because if we value the environment intrinsically, we morally owe the environment different considerations than if the environment is valued instrumentally for economic or human welfare reasons (Brennan and Lo 2022). However strong these arguments may be, they lack empirics. Psychologists have attempted to make a proxy for this ethical evaluation by measuring how individuals personally

value the environment through biospheric, altruistic, and egoistic value orientations (Schwartz 2012). However, these personal values do not explain environmental policy acceptance (Harring, Jagers, and Matti 2017; Nilsson, Hansla, et al. 2016). Instead, I examine if a policy's justification has an impact on policy acceptance regardless of other factors.

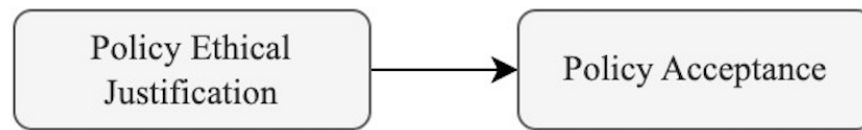
## **Research Aim:**

Worth noting, this study uses a case of environmental spending to promote biodiversity and species conservation. Because I base this study on a previously implemented policy, it has high internal validity of a non-anthropocentric policy and external validity in that it could be generalized and passed again in other contexts. Understanding what contributes to these successfully passed and implemented policies may help governments pass other conservation and environmental spending bills. Societal implications aside, the aim of this study is to answer two primary questions. First, *what effects do anthropocentric and non-anthropocentric ethical justifications have on policy acceptance?* Second, *do anthropocentric or non-anthropocentric justifications better promote environmental policy acceptance?* In the next section, I precisely theorize hypotheses to help answer these research questions.

## **Theory and Hypotheses:**

These research questions were inspired by a logical critique of Norton's convergence theory. Norton argues in *Towards Unity Among Environmentalists* (1995) for a convergence of anthropocentric and non-anthropocentric evaluations of nature. If the same environmental policy can be justified for anthropocentric and non-anthropocentric justifications, then it is best to adopt anthropocentric justifications (Steverson 1995). Norton argues that non-anthropocentrism hinders timely policy recommendations and alienates the anthropocentrists who may have the same environmental policy goal. Environmental pragmatists seem to assume that passing policy is the ultimate outcome (Light and Katz 1996). However, passing and creating policy is only part of the policy process. As explained in previous research, low policy acceptance during and after implementation has negative repercussions for governments and society (Drews and van den Bergh 2016; Matti 2015). Even if the policy recommendation is the same irrespective of anthropocentric or non-anthropocentric justifications, non-anthropocentric justifications might promote policy acceptance. The following model emerges as seen in figure 1.

Figure 1: Elaboration of Theoretical Model



I examine two ways to justify environmental policy—anthropocentrically and non-anthropocentrically. It is possible only one type of justification has any effect on policy acceptance, which inspires the first two hypotheses.

*H1: Policy acceptance is higher when the policy is justified anthropocentrically than without justification.*

*H2: Policy acceptance is higher when the policy is justified non-anthropocentrically than without justification.*

If I can establish one or both of the two hypotheses above, then the two following competing hypotheses emerge. Because the question arises which ethical justification would have a larger effect on policy acceptance.

There are a few primarily utilitarian, reasons to support Norton’s idea and promote anthropocentric justifications. As Callicott (1984) argues, if anthropocentrism is sufficient, then society does not need to change systemically and instead can rely on notions of human justice, duties, rights, and liberties using preexisting tools like cost-benefit analysis and discourse. Those in favor of anthropocentrism often promote the use of cost-benefit analysis to arrive at the best policy recommendation (Nyborg 2014). Wildlife, biodiversity, and protected areas may be countable through ecosystem services, which attempts to measure the worth of the species or natural areas on human wellbeing and economies (Adams 2014). And if countable, it is easier to use tools like cost-benefit analysis to compare policy alternatives. This relies on individuals’ willingness to pay, a reflection of an individual’s well-being, utility, or welfare measured by the maximum amount of money that he or she would be willing to give up or forego on behalf of the policy change (Pearce, Atkinson, and Mourato 2006, 45).

Ecosystem services are still difficult to calculate and require a fuller ecological understanding of biodiversity and habitat loss as effecting humans directly. According to Cardinale et al (2012), biodiversity policies are subject to fail because humans cannot fully comprehend how the ecosystems provide essential benefits on large scale economic and cultural levels, but with “fundamental understanding at hand, we may yet bring the era of biodiversity loss to a safe end



for humanity” (66). Further exploring the monetarized value of bees, beavers, aspen groves, etc. may be a very useful pursuit if we find that anthropocentric justifications are the best way to pass and promote impactful environmental policy and public acceptance.

If anthropocentric policy justifications are the best way to pass policy and leads to higher policy acceptance because it fits within our preexisting frameworks, this hypothesis emerges:

*H3: Anthropocentric policy justifications increase policy acceptance more than non-anthropocentric policy justifications.*

In contrast, Norton’s primary critique lies in the consequentialist line of reasoning that the means by which we arrive at the policy recommendation may be unethical or sub-optimal even if the consequence is better for the environment (Saner 2000). Sagoff (1991) provides the example of a criminal justice system where we cannot aggregate and measure how much people would be willing to pay for a guilty verdict; rather we have to consider the procedure by which we decide that verdict even if it is not the most generally preferred. If aspects of the environment are worth intrinsically valuing, then we need to spend our efforts on a fair and just process to determine how we use the environment.

The method should not matter if like Norton claims, convergence of non-anthropocentric and anthropocentric justifications does in fact lead society to good environmental and policy outcomes (Light and Katz 1996). However, I think Norton and fellow pragmatists’ argument is weak because he does not focus on the correct consequence. Their end goal is the policy recommendation and passage, but the relevant and essential outcome for my study, environmental policy, and democratic governments is policy acceptance.

Sagoff (1991) and McShane (2007a) make strong arguments that intrinsically valuing nature will lead to better policy outcomes because it 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 2007a, 178). Some theorists argue that a subjective human response to objects indicates an evaluative fact—that which we feel love for is in fact lovable indicating its intrinsic worth (Howard 2023). To feel love, awe, and respect towards the natural world indicates intrinsic value and to divorce that feeling from the policies undermines the attitudes we may want to take towards the land (McShane 2007a). McShane (2007b) claims humans have the capacity to feel a moral emotion towards nature that has been theorized before about our feelings and attitudes towards our

children and romantic partners. This follows logic with Rabinowicz and Ronnow-Rasmussen (2006) argument about the right or wrong reasons to have a positive attitude towards an object. Following this reasoning, the public may sense the policy makers are promoting policy for the wrong kinds of reasons which the public perceives as perverse and thus does not accept the policy as strongly as if it had been justified for the right kind of reasons.

Centering objects of intrinsic worth in policy is not historically unprecedented. Sagoff (1998) makes a distinction between social and economic policy in the book *The Economy of the Earth*. Shifting problems from the economic realm to social realm provides a framework to argue and potentially regulate that which the market once managed. Children were once born and raised to provide for parents in old age alongside working in mines and factors. Raising healthy, capable children was an economic choice for the family. Alongside the economic choice to have children, parents felt love and affection which indicated children's intrinsic value (Velleman 1999). When the policy makers were restricted to laissez faire economic conceptions of the labor market, it was difficult to conceptualize or recommend policy that would remove children from sweatshops and coalmines. However, the public shifted discussion of child labor from the economic to social realm and now policy makers can evaluate children as ends in themselves rather than means to an end (Sagoff 1991, 35). This shift in policy was a social decision to allow policy to reflect the attitudes—primarily love—we have towards our children even if there are still potential economic benefits involved in child rearing. Using this logic, the following hypothesis emerges:

*H4: Non-anthropocentric policy justifications increase policy acceptance more than anthropocentric policy justifications.*

In the following two sections, I present and justify the best policy case and method to test these theorized hypotheses in order to answer my research questions.

## **Case:**

The Colorado Habitat Connectivity Bill's (SJR21-021) main aim is the “support of the state of Colorado's efforts to preserve the state's flora and fauna through the protection of wildlife habitat connectivity” (Will and Danielson 2021). This bill funds infrastructure including two overpass bridges near large highways, five underpasses, 20 miles of wildlife fencing, 60 wildlife escape ramps, and two landscape bridges to connect open spaces for wildlife. The prime bill sponsors were of different parties: Jessie Danielson for the democrats and Perry Will for the republicans. It

was passed with bipartisan support in split congress with 32 supporting and 2 abstaining in the state senate and 56 supporting, 4 opposing, and 4 abstaining the state house. This broad bipartisan support indicates that this issue is not as political as other environmental problems which makes it easier to conduct an experiment about policy acceptance and isolate the ethical justification effects.

Roads act like an ecological edge that normally emerges out of natural topography, but roads are unsettling to the biome because they are so straight which requires clear cutting and changes micro biomes and climates (Coffin 2007). Roads have become a necessary aspect of human development and this disrupts existing ecosystems to various degrees. Since 1988, the number of vertebrates killed by vehicles surpassed hunting in the US; and animals die when they fail to reach resources like food, water, den sites, and mating grounds (Forman and Alexander 1998). Therefore, designing better roads initially that match the local landscape alongside infrastructure like corridors, fencing, and ramps are valuable conservation tools (Beier and Noss 1998; Coffin 2007).

Previous research on wildlife infrastructure pertains to its effectiveness in promoting biodiversity or ecosystem resilience from ecologists and biologists. Wildlife corridors connect two or more larger blocks of habitat to enhance the viability of specific wildlife that urbanization or human activity has disrupted (Beier and Noss 1998). There are mixed results about corridor's effectiveness because the impacted species are not always the same that the wildlife corridor intended to protect (Simberloff and Cox 1987). Hobbs (1992) argues that wildlife corridors became a "catch all solution" for human development. Some poorly planned corridors have spread disease and lured animals to areas with higher risk, so it may be better to instead expand protected areas even if those areas are isolated (Beier and Noss 1998). However, well designed corridors with local landscapes and biodiversity concerns in mind have been shown to alleviate threats of inbreeding, demographic stochasticity and the corridor itself may act as a habitat in its own right even if the target species fail to use them (Simberloff and Cox 1987).

There are very few public opinion polls specifically regarding wildlife infrastructure. However, there are increasing global commitments and public interest in biodiversity loss where wildlife infrastructure alongside the increasing protected land and sea areas may be some policy instruments to achieve these goals (Cardinale et al. 2012). As many ecosystems become more fragmented, there is increasing expectation placed on protected areas to contribute to local communities, tourism, replenish fisheries, and help contribute to mitigation and adaptation

(Watson et al. 2014). Biodiversity efforts are typically inspired by the idea that ecosystems provide essential benefits to humanity (Cardinale et al. 2012). If natural area's potential services are the primary policy justification to protect them, then the conservation policy objective is likely to fail because biodiversity and ecosystem services are in decline irrespective of increasing natural area conservation (Mace et al. 2014). The public may perceive this as a governmental failure to deliver what the government claims the natural area can provide. Ineffective, poorly planned policies decrease policy acceptance and compliance which might only demotivate further conservation efforts (Povitkina and Matti 2021). This is to say that passing conservation efforts justified by poorly understood ecosystem services may lead to long term policy acceptance and compliance issues. Whereas, if the policy can be passed on other grounds, then politicians and governments may not be beholden to what the conservation efforts can or cannot do for humanity's sake.

The policy as proposed in Colorado aligns well with philosophers' analyses of anthropocentric and non-anthropocentric justifications. The appendix includes a full copy of the bill's text. By building and changing the road infrastructure with fencing and overpasses to better accommodate wildlife, fewer animals will die. The loss of animal life can be understood at three non-anthropocentric levels. First, at the individual level, one specific animal can be killed by a vehicle. Second, if enough of the same type of animal is killed, it may have negative species population level implications. The bill says "One in five species is at risk of extinction in the United States, and Colorado is home to 33 threatened or endangered species... Protecting wildlife corridors has been shown to improve the herd vitality of big game species" (Will and Danielson 2021). Third, if the population or many populations are severely affected, then this could have biodiversity implications. Biodiversity is essential for the resilience of an ecosystem to keep a balance of food chains and mineral cycles (Butchart et al. 2012; Cardinale et al. 2012). In the bill's text, "wildlife corridors serve to connect wildlife habitat areas and allow for the movement, migration, and dispersal of native fish, wildlife, and plant species" (Will and Danielson 2021).

The policy was also justified anthropocentrically on behalf of the economy and road safety. The bill argues for the tourism and sportsman economy contributes to \$62 billion of the state's economy, employing over half a million people, and \$9.4 billion of state revenue; it was additionally passed on grounds of public safety and tax expenditure involved in road clean up (Will and Danielson 2021).

This policy case of wildlife infrastructure from Colorado is one of the best ways to study policy justification and acceptance. It has high internal validity because it has been justified different ways that align with philosophical anthropocentrism and non-anthropocentrism notions. It has high external validity because it has already been passed in Colorado and a similar policy could more easily be passed in other American states. Its generalizability beyond the American context may be more limited but still contribute to how and why conservation efforts may be acceptable in other contexts.

#### Possible confounder: Partisanship

As discussed in the previous research section, there are many individual and contextual policy acceptance factors that could be rival theories and a more comprehensive study may take more of these into account. This study is most concerned with political identification because it most logically influences the experimental design in how political identification may predispose respondents to interpret the justification. It is possible that the association I find is redundant in that policy justification shares too much explanatory power with political identification. Therefore, in the analysis, I treat political party identification as a rival independent variable. Rival independent variables are used to check that policy justification is indeed a novel causal factor that goes beyond what current factors already explain (Aneshensel 2013).

If there are partisanship effects, I expect republicans to be less supportive of wildlife infrastructure regardless of justification because it is a form of government spending. Democrats are twice as likely to prioritize the environment rather than other topics like national security and strengthening the economy (Anderson 2017). Current trends indicate that the primary reason republicans do not support stricter environmental laws is because it costs jobs and economic growth (Anderson 2017). However, this is not the focus of my study and will only be used to test the validity of policy justification effect.

Environmental policies in the US are becoming increasingly tied to partisanship, so I chose a policy issue where partisanship is not expected to be as relevant. Wildlife corridors are a decent example of an American stewardship ethic which has a long history with origins in conservatism and republicanism dating back to the 1850s (Shutkin 2001). According to Pew Research Center, the majority of Americans (90% democrats and 52% republicans) believe the country should do “whatever it takes to protect the environment” (Anderson 2017). 68% of Americans want to protect water quality, 67% air quality, 62% animals and their habitats, and 55% open land in national

parks and nature preserves (Funk and Hefferon 2019). Because I expect wildlife corridors to be a generally supported policy, there may be ceiling effects where too many participants answer “strongly in favor” for policy acceptance question(s). By choosing a less controversial policy case, I potentially compromise wide variance in responses, but it is a sacrifice I make so that partisanship does not have a large effect. In the methods section, I explain how to use this policy case and account for the rival variable.

## **Method:**

### Research Design:

Experimental research should establish a causal link between the independent variable, policy justification in this case, and dependent variable, policy acceptance. Experimental methods assume the cause occurs shortly before the effect and that the effect would not have occurred without the cause (Field 2017). A control group without manipulation provided the baseline for confounding variables (Field 2017, 16–17). Unlike correlational research, I did not examine the co-occurrence of variables (e.g., demographic indicators) because this is accounted for by the control condition (Field 2017, 19). I used experimental surveys in order to establish causal relationships because they are a way to balance high internal and external validity (Mullinex et al. 2015; Atzmüller and Steiner 2010).

For many reasons, I adopted experimental vignette methodology (EVM) where researchers design descriptions that systematically vary in order to control the information that participants receive (Steiner, Atzmüller, and Su 2016). First, EVM provides greater realism by offering a range of situational and contextual factors that approximate real life decisions rather than abstract judgements (Dülmer 2016). This study’s vignettes were based on the Colorado Habitat Connectivity Bill because Aguinis and Bradly (2014) strongly promote presenting “actual derived cases” where the manipulations are based on actual settings with realistic factors to increase the generalizability of the result. By supplying standardized stimuli to all participants, this increases internal validity, measurement reliability, and ease of replication (Wason, Polonsky, and Hyman 2002). Second, researchers have high control over manipulated antecedents by standardizing what information participants have implying even insignificant results provide a high degree of certainty the specific treatment did not work (Aguinis and Bradley 2014). This explains why I provide standard basic information about the policy and which politicians voted to pass it in an attempt to

control for political orientation and ensure the treatment I provided attempted to cause a valid effect.

I conducted a between group study with a control and two experimental groups.<sup>1</sup> There were three groups that were randomized through the Qualtrics platform. I asked the first group, henceforth called control group, without any vignette/treatment about their policy preferences. The second group received anthropocentric justifications and the third group received non-anthropocentric justifications. Then, the second and third groups were asked about their policy preferences. Wason et al. (2002) argues between group studies are difficult to evaluate the underlying process. In this way, these studies are limited in that the treatment vignettes serve as a reference point but may not reflect the true judgments of the respondent (Aguinis and Bradley 2014). There may be additional issues comparing the participants because I was not able to control the context of an online survey (Atzmüller and Steiner 2010).

#### *Statistical Analysis:*

I used demographic control variables to test whether random assignment via Qualtrics produced balanced samples across potential confounders. The goal of randomization is that each participant was equally likely to be placed in the control or two experimental groups. After conducting the experiment, I evaluated the randomization with ANOVA by making the demographic variables the independent variables and the group assignment the dependent variable. If the F scores were large enough to statistically determine which group participants would belong, then the groups were not randomly assigned (Field 2017, 527).

I tested my focal relationships with t-tests rather than ANOVA because my theorized hypotheses compare two groups at a time. T-tests (and ANOVA) have four main assumptions which I attempted to account for in my study design and statistical analysis. First, the dependent variable should follow a continuous or ordinal scale, so I used a Likert scale of 1 to 5. Second, the sample should be randomly selected and assigned groups from a representative population which

---

<sup>1</sup> A between group study is preferred to the alternative within group EVM approach. Often used in policy capturing and conjoint analysis, a within group experimental design would first ask participants their attitude towards a wildlife corridor without any vignette, then randomly provide the anthropocentric/non-anthropocentric vignette followed by the one they were not first provided. Participants would be asked about the policy preferences after each vignette and then reveal their judgement about both vignettes (Wason, Polonsky, and Hyman 2002). Then multilevel statistical analysis is conducted to see what is the most effective justification. With only two treatments, the experimental design would be too obvious to participants and satisfaction would probably occur. What's more, my research aim pertains to what generates policy acceptance overall not policy attitude formation.

is why I chose the platforms mturk and Prolific to distribute my study. Even though the study is not perfectly representative, it is better than student samples and cheaper than panel studies (Douglas, Ewell, and Brauer 2023). Third, the data should be normally distributed which is the most difficult to achieve given concerns regarding ceiling effects and skewing (Field 2017). I tested many dependent variables in the pilot study to settle on the five with the most normal distribution. The final assumption is a homogeneity of variance in that the standard deviations are approximately equal; if this is not the case, a t-test of unequal variances could have been conducted to make the statistics more robust.

My research design and statistical analysis accounted for all t-test assumptions, so then I ran t-tests to compare each treatment to the control and the treatments to each other. Independent t-tests compare the means of the two groups for statistical significance (Field 2017, 453). The null hypothesis is that there is no difference in means of policy acceptance between (1) the control and anthropocentric treatment, (2) control and non-anthropocentric treatment, and (3) anthropocentric and non-anthropocentric treatment. There were 15 t-tests based on 5 dependent variables (to be discussed in the operationalization section) for each of the three conditions. First, I checked that the groups have equal variances using Levene's test so that I could run a t-test with equal variances (Field 2017, 259). Then, I could reject the null hypotheses and accept my theorized hypotheses if the difference between means were large enough at a confidence level of 95% that such a difference could not be assumed to be left to chance (Field 2017, 325).

For the relationships that returned a significant t-test, I ensured the dependent variable effect was not due to the theorized confounding variable of political identification by considering it a rival variable. I ran linear regressions with the statistically significant dependent variables, treatment group, and political orientation. If the dependent variables lost significance when political orientation was included in the linear regression model, then I could not be sure the measured effect on policy acceptance was due to justification rather than political identification (Aneshensel 2013).

#### Pilot Studies:

I conducted three rounds of pilot studies of approximately 110 participants for two reasons. First, I conducted the first and second pilot studies in order to assess the best vignette to be used for treatment and dependent variables with the most normal distribution. The first pilot study was online through convenience sampling of friends and family in Sweden and the second pilot study



was conducted in person on paper at the University of Gothenburg. Both in person and online surveys had an option to leave comments and contact information at the end of the survey. Second, pilot studies ensured the survey questions were clear and there were no technical issues with the online platforms. This was the explicit goal of the final online pilot survey completed by 44 American participants recruited via convenience and snowball sampling and included all control and rival variables.

It is common practice to test variations of the vignettes with different wording to ensure that it is the vignette's objective information rather than the phrasing eliciting the participant's response (Wason, Polonsky, and Hyman 2002). I included two different control versions and three different versions of the anthropocentric and non-anthropocentric vignettes. I relied on manipulation checks to ensure that my finalized vignettes were the most clear and effective version possible. Anthropocentric treatment was the most difficult to finalize because nearly 25% of respondents responded "savings animals' lives" rather than "improving the economy and public health." One respondent clarified upon follow up using provided contact information, "the reason I didn't choose (improve the economy) was that, even though politicians said the proposal would improve the economy, I have a hard time believing that was the true motivation behind the proposal. If the politicians wanted to improve the economy, they would have done something else." This response (which was echoed by two other people who failed the manipulation check) seemed to indicate that the manipulation actually works, and pilot study participants thought critically about the treatment. I made adjustments so that in the final pilot study, people who failed the manipulation check had different qualitative responses like "I think I misread the question" and "now that I'm looking at the question again, I see how improving the economy is the appropriate answer." These new responses indicate that the most updated vignettes and manipulation checks were more valid. Also, the new manipulation check acted as an attention check which justified excluding final participants who failed this question from the analysis.

Survey distribution and procedure:

I created the pilot and official surveys on Qualtrics which was responsible for randomizing the control and two treatment groups. I released the final survey using the professional marketing platform Prolific to vet respondents on Amazon's mechanical turk (henceforth mturk with participants called mturkers). I briefly outline the concerns mturk raises that can be partially

compensated by Prolific in this section, though ultimately conclude the benefits outweigh concerns.

Mturk is a crowdsourcing platform to recruit people for interactive online experiments and other human intelligence tasks. Online research generally has promising results in that classical findings from psychology and economics have been effectively replicated online and deemed as reliable as when results are obtained through more traditional methods (Arechar, Gächter, and Molleman 2018). Mturk is quite flexible and especially well-suited for experimental vignette methods; compared to panel, population data, mturkers give better quality data, are less likely to skip questions, and have more variance in responses (Weinberg, Freese, and McElhattan 2014). However, data quality should be consistently questioned and vetted as online research can be affected by events external to the platform (Douglas, Ewell, and Brauer 2023).

Platforms like Cloud Research and Prolific vet high versus low quality participants in an attempt to compensate for the questionable mturk data quality (Douglas, Ewell, and Brauer 2023; Hauser et al. 2022). I used Prolific which specifically recruits and vets participants for research unlike mturk, originally intended for commercial purposes (Palan and Schitter 2018). When paired with mturk, Prolific provides the highest quality of data at the lowest cost compared to other platforms like Cloud Research, Qualtrics panels, and SONA (Douglas, Ewell, and Brauer 2023).

Population based samples are still the best quality and representative samples but are expensive; the key question is whether the cost of population-based samples is worth the relatively small data quality differences (Weinberg, Freese, and McElhattan 2014). Writing a master's thesis from Sweden but using an American sample would have been difficult to find participants quickly. I would have relied primarily on snowball sampling like my final American pilot study which would limit the generalizability of my results. Given these limitations, mturk and Prolific saved time and provided objectively better data than if I had not used it. Findings from this study may be complemented later with a controlled laboratory study or larger population panel study with mturk providing the basis for the generalizability of future findings (Aguinis, Villamor, and Ramani 2021).

#### Operationalization of concepts:

In this section, I explain how I operationalize key concepts. Policy acceptance is a relatively new field of study but emerges at the intersection of political science and psychology. Defined by psychologists, attitudes are evaluations of any object of thought often measured through self-

reported scales (Bohner and Dickel 2011, 392). How researchers measure policy attitudes is complicated by how terms acceptability, acceptance, and support have not been theoretically sound or standardized in previous research (Kyselá, Ščasný, and Zvěřinová 2019). In order to provide solid policy insight and be academically rigorous, researchers must be clear about measurement given how survey questions tap different psychological theories depending on the question’s framing and binary or scalar answers (Kyselá, Ščasný, and Zvěřinová 2019, 881).

*Independent variable: Treatment*

The independent variable of policy justification was handled by different vignette treatments. Qualtrics randomized the groups with (1) the control paragraph or the control paragraph with either (2) anthropocentric or (3) non-anthropocentric vignettes. The final vignettes are found in Table 1 and were selected on grounds of clarity, brevity, and highest manipulation check passage based on three rounds of pilot studies. I underlined and bolded key phrases in an attempt to make the treatments stronger. All phrasing comes from the Colorado bill found in the appendix.

*Table 1: Experimental groups and treatment*

<i>Group</i>	<i>Treatment</i>	<i>Vignette</i>
1	Control	In 2021, Colorado passed a Wildlife Corridor Connectivity Bill to build wildlife crossings between open spaces. It includes overpass bridges, underpasses, fencing, escape ramps, and two landscape bridges. The bill was sponsored and passed by republicans, democrats, and independents. Your state government wants to pass similar wildlife infrastructure and we will ask you about your opinion even if this is a new proposal to you.
2	Anthropocentric (A treatment)	(Insert the control paragraph.)  This bill is being passed because hitting wildlife is <u>dangerous for people and costly to clean up</u> . This bill would <u>increase property values</u> of the land adjacent to wildlife corridors, increase food security, and improve ecosystem services to enhance human quality of life. This bill's primary purpose is to <b>improve the tourism economy and public road safety</b> .
3	Non-Anthropocentric (NA treatment)	(Insert the control paragraph.)  This bill is being passed because habitat loss and fragmentation are major contributors to <u>declines in populations of native wildlife</u> . Maintaining connected habitats is recognized as one of the most effective biodiversity conservation measures. This bill would <u>connect habitats</u> to promote movement, migration, and dispersal of native wildlife and plant species. The bill’s primary purpose is to <b>prevent habitat and biodiversity loss by saving wildlife from vehicle collisions</b> .

In order to conduct hypothesis t-testing, I created 3 dummy variables with coding seen in table 2. For visualization and to check randomization via ANOVA, I use the treatment coding.

Table 2: Treatment coding

	Treatment	A Treatment dummy (control as reference)	NA treatment dummy (control as reference)	Between treatment dummy (A as reference)
Participant A	1	0	0	-
Participant B	2	1	-	0
Participant C	3	-	1	1

*Dependent variable:*

This study contributes to policy acceptance literature, but I operationalized my dependent variable as acceptability rather than acceptance for a number of reasons. To reiterate from previous research, acceptability is attitude before implementation and acceptance is attitude after implementation (Kyselá, Ščasný, and Zvěřinová 2019). If I were to have studied acceptance, I would have limited my potential participants to the 5.8 million residents who live in Colorado where the policy was implemented. Instead, by measuring acceptability all other American inhabitants but those in Colorado were eligible for participation. Using Prolific’s vetting service, location was the only qualification to participate in this study. Participants had to reside in the US in order to control for national contextual factors that may affect policy acceptance but could not be from Colorado. Second, high causal factors like effectiveness and perceived personal and contextual impacts are unknown and therefore less impactful before implementation so the effect of justification is easier to identify by measuring acceptability. Lastly, this study was inspired by Norton’s arguments about policy creation and passage being hindered by non-anthropocentric justification which was easier to engage with using acceptability.

I measured policy acceptability with two different types of questions in order to be sure I had dependent variables sensitive enough to detect the effects of justification. The first is called *policy acceptability* for the remainder of this paper. I asked, “What is your opinion of the following proposals by your local government?” with three policies: (1) building wildlife infrastructure, (2) spending tax money to build wildlife infrastructure, and (3) implementing a road toll where the wildlife infrastructure is located. I chose these three policies as a way to account for potential ceiling effects. Given the bipartisan passage of this bill, I expected very few respondents to be strongly against wildlife infrastructure generally (option 1). Previous research shows that policies with higher perceived costs have lower policy support (Matti 2015), so I expected more normal answer distribution for the latter two policy suggestions to make the effect of treatment easier to determine. Additionally, I used the Likert scale where 1 is strongly against, 3 is neither in favor or

against, and 5 is strongly in favor. Likert scales are a common way to measure attitudes and provide more nuance and variance than a yes/no response (Bohner and Dickel 2011).

The second type of policy acceptability question is called *policy prioritization*. This was an attempt to sense how participants would prioritize or prefer wildlife infrastructure compared to other proposals. I asked these questions because partisanship (a confounding variable) becomes most apparent when comparing policies (Anderson 2017). This ensured that the policy justification effects I detected were not just a proxy for political identification. The questions were “How much do you prefer wildlife infrastructure compared to (1) paving country roads and passes and (2) improving road maintenance (potholes, signage repair, proper drainage, etc.)?” There were five options coded as follows: 1= “strongly in favor of paving country roads/better road maintenance” 2= “somewhat prefer paving roads/better road maintenance,” 3= “equally prefer both,” 4= “somewhat prefer wildlife infrastructure,” and 5= “strongly in favor of wildlife infrastructure.” Worth highlighting, the higher this value, the stronger preference for wildlife infrastructure.

#### *Rival Variable: Political Orientation*

I asked for participants political’ orientation, henceforth *party identification*, because it could be a confounding variable masking the true effect of the treatment. The question “generally speaking, how do you think of yourself politically?” had the options “republican,” “democrat,” “independent,” “other,” and “no preference.” If participants responded with the latter three options, they were prompted with “do you think of yourself as closer to the Republican or Democratic party?” with two options. I coded all republicans and republican leaning as 0 and democrat and democrat leaning as 1. It is common to combine party identification and party lean because those who identify as independent more often than not vote and align interests with the party they lean towards (Jones 2022). In the statistics summary, I provide all political categories in order to properly compare with the general American public.

#### *Control variables:*

I asked the following demographic questions in order to determine how representative my sample was and check randomization of groups. Sex was measured categorically where 0= “man”, 1= “female” and 2= “prefer not to answer”.

Age was measured categorically where 1= “under 18”, 2= “18-24 years old”, 3= “25-34 years old,” 4= “35-44 years old,” 5= “45-54 years old,” 6= “55-64 years old,” and 7= “65+ years old.”

Education was asked, “what is the highest level of school you have completed or the highest degree you have received?” The options were coded as 1= “less than high school degree,” 2= “high school graduate (or equivalent including GED),” 3= “some college but no degree,” 4= “associate degree in college (2-year),” 5= “bachelor’s degree in college (4-year),” 6= “master’s degree,” 7= “doctoral degree,” and 8= “professional degree (JD, MD).”

Participants could choose one or more races or ethnicities they considered themselves to be including white, black or African American, American Indian or Alaska Native, Asian, Native Hawaiian or Pacific Islander. The participants were also asked “are you Spanish, Hispanic, or Latino?” I recoded and combined race/ethnicity as follows: 1= “white,” 2= “black or African American,” 3= “American Indian or Alaska Native,” 4= “Asian”, 5= “Native Hawaiian or Pacific Islander,” 6= “Spanish, Hispanic, or Latino”, and 7= more than 2 races/ethnicities selected.

The question “in which state do you currently reside” was the only qualifying question where participants selected from the fifty American states, Washington DC, and Puerto Rico. All other states were included and coded with numbers in alphabetical order where 1=Alabama, 2=Alaska, 3=Arizona, etc. This question also checked that Prolific’s vetting service worked.

Location was posed “Please describe in what type of area you live” and was coded categorically where 1= “big city, central,” 2= “big city, fringe/suburb,” 3= “city or large town, central,” 4= “city or large town, fringe/suburb,” 5= “small town,” and 6= “rural.”

*Attention and manipulation check:*

After the demographic questions but before the political questions, I put an attention check where participants were instructed to type the word “check” in a box. This is an instructional attention check to assure data quality and standard in online experiments (Abbey and Meloy 2017).

Manipulation checks are important to ensure data quality but difficult to determine validity. Placed after the dependent variables, respondents may not properly remember the treatment, but if placed before the dependent variables, it might reinforce treatment and effect results (Hauser, Ellsworth, and Gonzalez 2018). This may not be a valid manipulation check because respondents explained in final pilot studies that they failed because they were providing their opinion, an effect that was exacerbated when putting the manipulation check after the dependent variables. Therefore, I added the two instructional sentences so the question reads as follows: “This question is not asking for your opinion. This is to confirm you read the text. What do you perceive is the purpose of this wildlife infrastructure *in the paragraphs above?*” with the randomized options

“improve the economy and make roads safer for people,” “save animals’ lives,” and “build beautiful infrastructure.”

## **Data:**

The survey was administered April 26 and 27, 2023. 723 participants<sup>2</sup> were paid 0.45 British pounds for a survey that took on average 2:36 minutes. 9 participants’ data were removed because they either failed the attention and/or manipulation check or Qualtrics flagged them as a potential robot. 5 participants were removed for failing the non-anthropocentric manipulation check where 1 answered “build beautiful infrastructure” and the other four answered “improve the economy and make roads safer for people” as the main purpose of the wildlife infrastructure policy. 36 participants were removed for failing the anthropocentric manipulation check where 1 answered “build beautiful infrastructure” and the other 35 answered “save animals’ lives.” Worth noting, 78% of the control group responded “save animals’ lives” to the same question, though no participants could be excluded on these grounds,

Table 7 in the appendix summarizes the demographic statistics of the remaining 671 participants. The recruited participants were not intended to be representative of the American public but are still more diverse than if only university students had been recruited (Hauser et al. 2022). When looking at the final two columns of table 7 in the appendix, generally, the study’s sample is higher educated and not as ethnically/racially diverse as the American public. More participants are 25-34 than any other age group, which is probably a reflection of who has access and interest to online surveying. The survey sample underrepresents the rural population which is problematic given their use of wildlife infrastructure, most likely living closer to the places where these infrastructure initiatives would be implemented. Lastly, the study’s sample is more democrat or democrat leaning than the general American public. These representational issues are not expected to have a large effect on the experiment’s focal relationship because demographic effects are not theorized to be affected by the manipulation. The only confounding variable that may have an effect is the democrat political orientation, and this is addressed in the analysis. To summarize, this study cannot generalize to rural and less educated American populations.

---

<sup>2</sup> Using Prolific’s vetting service to improve data quality, participants must have completed 20 previous jobs on Prolific with a 90% acceptance rate.

More importantly for the experimental design, the control and two experimental groups were relatively similar; there were no demographic between group differences that would influence the effect of manipulation. Table 3 shows the results from the ANOVA randomization test. There appears to be no systematic errors in the treatment and control group which means participants have been randomly assigned because all F values were lower than 2.5 and statistically insignificant except for party identification. *Party identification* has an F score of 4.22 at 0.04 significance level which means these groups have not been properly randomized and the results should be interpreted with caution. The anthropocentric treatment group had nearly 15 percentage points more democratic identifying people than the control group and the non-anthropocentric treatment had 10 percentage points more democratic identifying people than the control group (see table 7 in the appendix).

Table 3: Randomization Control

	<i>F statistic</i>	<i>Significance</i>
<i>Sex</i>	0.56	0.57
<i>Age</i>	1.59	0.15
<i>Education</i>	0.48	0.85
<i>Location</i>	0.73	0.60
<i>Party Identification</i>	4.22	0.04

Source: Qualtrics Survey April 2023

Table 4 and figures 2 and 3 provide the same information. The control group, which did not receive any justification treatment, report the lowest levels of wildlife infrastructure policy acceptability and prioritization compared to the other groups. The control group has lower reported means for all dependent variables at 4.18, 3.78, 2.94, 3.48, and 2.73. The anthropocentric and non-anthropocentric treatments groups (henceforth called A and NA treatment in all charts and graphs) have higher reported means than the control for all dependent variables. When comparing the two treatment groups, NA treatment's reported means are higher for all policy acceptability variables (*building infrastructure, spending tax money, and implementing road tolls*) at 4.39, 4.09, and 3.12 compared to A treatment at 4.36, 4.00, and 2.95. Whereas, A treatment's reported means are higher for policy prioritization dependent variables (*paving new roads and improving road maintenance*) at 3.72 and 2.99 compared to NA treatment at 3.57 and 2.90.



Table 4: Mean estimation of Dependent Variables

	Mean	Std. dev.	Std. error.	95% CI Lower	95% CI Upper
<b>Policy Acceptability (n=671): What is your opinion of the following proposals by your local government where 1 is strongly against and 5 is strongly in favor?</b>					
<i>Building Infrastructure</i>					
Control	4.18	0.80	0.05	4.07	4.28
A treatment	4.36	0.84	0.06	4.24	4.47
NA treatment	4.39	0.83	0.05	4.28	4.50
<i>Spending tax money</i>					
Control	3.78	1.08	0.07	3.64	3.92
A treatment	4.00	1.01	0.07	3.87	4.14
NA treatment	4.09	0.98	0.06	3.96	4.21
<i>Implementing Road Tolls</i>					
Control	2.94	1.27	0.08	2.78	3.10
A treatment	2.95	1.28	0.09	2.77	3.12
NA treatment	3.12	1.27	0.08	2.95	3.28
<b>Policy Prioritization (n=671): How much do you prefer wildlife infrastructure compared to (x) where 1 is strongly in favor of (x) and 5 is strongly in favor of wildlife infrastructure?</b>					
<i>Paving New Roads</i>					
Control	3.48	1.11	0.07	3.34	3.62
A treatment	3.72	1.04	0.07	3.57	3.86
NA treatment	3.57	1.10	0.07	3.43	3.72
<i>Improving Road Maintenance</i>					
Control	2.73	1.08	0.07	2.59	2.86
A treatment	2.99	1.12	0.08	2.83	3.14
NA treatment	2.90	1.13	0.07	2.75	3.04

Figure 2: Mean estimation of policy acceptability

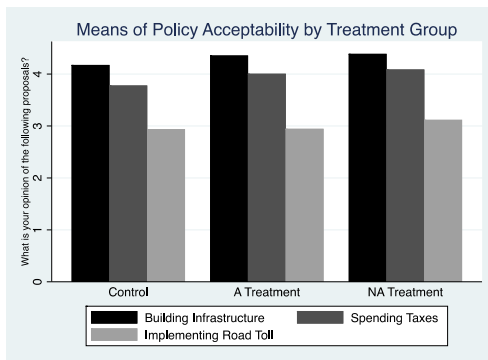
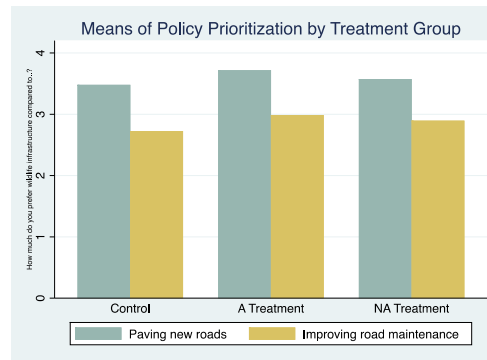


Figure 3: Mean estimation of policy prioritization



Regarding normality, the dependent variables for policy acceptability *building infrastructure* and *spending taxes* were positively skewed towards 4 on the 5-point scale based on a visual check. The distribution for the other dependent variables is uniform with a flat shape indicating the standard deviations from the mean are quite large. Field (2017) argues that distribution tests may be significant for small and unimportant effects for a large sample size. “As the sample gets larger, the assumption of normality matters less because the sampling distribution will be normal regardless of what our population (or indeed sample) data looks like” (Field 2017, 248).<sup>3</sup> Given the preliminary power analysis<sup>4</sup>, I assume that the distribution problems can be accounted for by the sample size to show meaningful effects and made no further adjustments.

## Results:

Table 5 shows the results from t-tests of equal variances to compare the means of each treatment group by using treatment dummy variables.<sup>5</sup> In order to test anthropocentric treatment v. control, I excluded all participants in the non-anthropocentric treatment group and ran a t-test on the anthropocentric treatment dummy variable and all 5 dependent variables. I ran similar tests for non-anthropocentric v. control, excluding anthropocentric treatment participants; and non-anthropocentric v. anthropocentric, excluding control participants. All statistically significant effects are above 0.2 for Cohen’s d-efficient which is considered a small effect; any dependent variables below this threshold were too small to detect an effect and statistically insignificant, so I discuss them no further. There were six of 15 dependent variables with statistically significant differences in their means which I now further discuss.

As seen in table 5, the t-tests when comparing anthropocentric treatment to the control group. The two tailed t-test for independent samples was statistically significant (p value equal or lower than 0.05) for *building infrastructure* and *spending taxes*. T-tests were also significant (p-value equal or lower than 0.05) for both policy prioritization indicators. Confidence interval ranges

---

<sup>3</sup> Table 8 in the appendix shows results from Shapiro-Wilk and Skewness and Kurtosis tests. These results confirm that *building infrastructure* and *spending taxes* are not normally distributed and all variables have significant skew.

<sup>4</sup> I set the power to 0.8, my statistical significance to .05 and effect size (Cohen’s d) to 0.32 aligning with suggestions from Weidmaier (2017). I set Cohen’s d to be low so that the test will be very sensitive to when the relevant group’s mean is different than the reference group’s mean (Magnusson n.d.). Calculations indicated I needed approximately 200 high quality participants per group and assumed that 20% would fail attention or manipulation checks (Hauser and Schwarz 2016), so I recruited 240 participants per group or 730 participants total.

<sup>5</sup> Based on Levene’s test of covariance, all dependent variables have a p-value above 5% significance level as shown in table 5. The test is not significant, so all variances in the group are assumed to be equal.

are at 95% and degrees of freedom are 440. The differences between 0 and 1 with respect to *policy acceptability: building infrastructure* has a t-value at -2.32 with confidence interval limit differences at -0.34 and -0.03 with a -0.22 effect size, *policy acceptability: spending taxes* has a t-value at -2.26 with confidence interval limit differences at -0.42 and -0.29 with a -0.21 effect size, *policy prioritization: paving roads* has a t-value at -2.32 with confidence interval limit differences at -0.44 and -0.04 and a -0.22 effect size, and *policy prioritization: paving roads* had a t-value at -2.48 with confidence interval limit differences at -0.47 and -0.05 with a -0.23 effect size.

To compare non-anthropocentric treatment to the control group, table 5 shows the results for the t-tests. The two tailed t-test for independent samples was statistically significant (p value lower than 0.01) for *building infrastructure* and *spending taxes*; all confidence interval ranges are at 95% at 467 degrees of freedom. The differences between 0 and 1 with respect to *policy acceptability: building infrastructure* has a t-value at -2.83 with confidence interval limit differences at -0.36 and -0.07 with a -0.22 effect size and *policy acceptability: spending taxes* has a t-value at -3.24 with confidence interval limit differences at -0.50 and -0.12 with a 0.30 effect.

Table 5: t-test Results for all Dependent Variables

	Levene f value	t-statistic	95% CI Upper difference	95% CI Lower difference	Cohen's d (effect size)
<b>A treatment v. Control (df=440)</b>					
Policy Acceptability					
<i>Building Infrastructure</i>	0.93	-2.32*	-0.34	-0.03	-0.22
<i>Spending Taxes</i>	1.14	-2.26*	-0.42	-0.29	-0.21
<i>Implementing Road Toll</i>	0.99	-0.07	-0.25	0.23	-0.01
Policy Prioritization					
<i>Paving Roads</i>	1.13	-2.32*	-0.44	-0.04	-0.22
<i>Road Maintenance</i>	0.94	-2.48**	-0.47	-0.05	-0.23
<b>NA treatment v. Control (df=467)</b>					
Policy Acceptability					
<i>Building Infrastructure</i>	0.94	-2.83***	-0.36	-0.07	-0.22
<i>Spending Taxes</i>	1.21	-3.24***	-0.50	-0.12	-0.30
<i>Implementing Road Toll</i>	1.01	-1.53	-0.41	0.05	-0.14
Policy Prioritization					
<i>Paving Roads</i>	1.01	-0.91	-0.29	0.11	-0.08

<i>Road Maintenance</i>	0.92	-0.67	-0.37	0.03	-0.15
<b>A treatment v. NA treatment (df=429)</b>					
Policy Acceptability					
<i>Building Infrastructure</i>	1.02	-0.40	-0.12	0.13	-0.03
<i>Spending Taxes</i>	1.07	-0.86	-0.27	0.11	-0.08
<i>Implementing Road Toll</i>	1.02	-1.40	-0.41	0.07	-0.14
Policy Prioritization					
<i>Paving Roads</i>	0.89	1.4	-0.06	0.35	0.14
<i>Road Maintenance</i>	0.98	0.83	-0.12	0.30	0.14

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ , Source: Qualtrics Survey April 2023

It is beyond the scope of this study to examine how political identification may interact with the independent variable of policy justification and therefore effect policy acceptance. Political identification was not properly randomized between the control and 2 treatment groups to make conclusions pertaining to its effect (see table 3). Instead, I used political identification to test the accuracy of my finding pertaining to policy justification. I included political identification in a regression with the treatment dummy variables to test the rival variable. The sample became smaller for all models because some participants chose not disclose their political identification. Models 1, 3, 5, 7, 9, and 11 in table 6 show the focal relationship for the significant dependent variables and provides coefficients if using a regression. Though not provided in table 6, the  $p$ ,  $t$ , and confidence interval values match table 5 because the  $t$ -test runs the same mathematical means comparison tests as the regression (Field 2017, 522). Therefore, the coefficients are not discussed here because their significance has been reflected and discussed above. Models 2, 4, 6, 8, 10, and 12 are elaborations of the focal relationship by including the rival variable *party identification*.

As seen in model 2 in table 6, with the presence of A treatment, policy acceptability for *building infrastructure* increases 0.15 with the standard error indicating the observations differ 0.09 from prediction. However, the  $p$ -value decreases below statistical significance when adding *party identification*. Being a democrat increases *building infrastructure* policy acceptance by 0.21 at a 95% significance level with a standard error of 0.09. The constant predicts that a republican in the control group has a 3.87 level of policy acceptability. The adjusted  $R^2$  shows that the model explains 2.1% of the variation in policy acceptability.

Model 4 in table 6 shows policy acceptability for *spending tax* increases 0.11 with the standard error of 0.11 with the presence of A treatment. However, the  $p$ -value decreases below

statistical significance when adding *party identification*. Being a democrat increases *spending tax* policy acceptability by 0.54 at a 99.9% significance level with a standard error of 0.11. The constant predicts that a republican in the control group has a 2.95 level of policy acceptability. The adjusted  $R^2$  shows that the model explains 6.2% of the variation in policy acceptability.

Model 6 shows with the presence of A treatment, policy prioritization of wildlife infrastructure to paving new roads increases 0.25 with the standard error of 0.11. The p-value remains above the 95% significance level even when adding *party identification*. Being a democrat increases wildlife infrastructure prioritization compared to paving roads by 0.40 at a 99.9% significance level with a standard error of 0.11. The constant predicts that a republican in the control group has a 2.80 level of wildlife infrastructure policy prioritization. The adjusted  $R^2$  shows that the model explains 4.3% of the variation in policy prioritization.

Model 8 shows with the presence of A treatment, policy prioritization of wildlife infrastructure to improving road maintenance increases 0.26 with the standard error of 0.11. The p-value remains above the 95% significance level even when adding *party identification*. Being a democrat increases wildlife infrastructure prioritization compared to paving roads by 0.11 with a standard error of 0.11 but this is not statistically significant. The constant predicts that a republican in the control group has a 2.55 level of wildlife infrastructure policy prioritization. The adjusted  $R^2$  shows that the model explains 1.3% of the variation in policy prioritization.

Model 10 shows with the presence of NA treatment, policy acceptability for *building infrastructure* increases 0.23 with the standard error indicating the observations differ 0.08 from prediction at a 99% significance level. Being a democrat increases *building infrastructure* policy acceptability by 0.28 at a 99.9% significance level with a standard error of 0.08. The constant predicts that a republican in the control group has a 3.72 level of policy acceptability. The adjusted  $R^2$  shows that the model explains 1.5% of the variation in policy acceptability.

Model 12 shows with the presence of NA treatment, policy acceptability for *spending tax* increases 0.27 with the standard error of 0.10 at a 99% significance level. Being a democrat increases *building infrastructure* policy acceptability by 0.61 at a 99.9% significance level with a standard error of 0.10. The constant predicts that a republican in the control group has a 2.85 level of policy acceptability. The adjusted  $R^2$  shows that the model explains 10.1% of the variation in policy acceptability.

Table 6: Linear Regression Results

	Policy Acceptability: Building infrastructure (A treatment)		Policy Acceptability: Spending Tax (A treatment)		Policy Prioritization: Paving roads (A Treatment)		Policy Prioritization: road maintenance (A treatment)		Policy Acceptability: Building Infrastructure (NA treatment)		Policy Acceptability: Spending Tax (NA treatment)	
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
Treatment ( <i>control</i> as reference)	0.18*	0.150	0.226*	0.107	0.239*	0.249*	0.260*	0.263*	0.214**	0.227**	0.308**	0.265**
	(0.08)	(0.09)	(0.10)	(0.11)	(0.10)	(0.11)	(0.11)	(0.12)	(0.08)	(0.08)	(0.10)	(0.10)
Party identification ( <i>republican</i> as reference)		0.21*		0.54***		0.40***		0.11		0.28***		0.61***
		(0.09)		(0.11)		(0.12)		(0.12)		(0.08)		(0.10)
Constant	4.18***	3.84***	3.78***	2.95***	3.48***	2.81***	2.73***	2.55***	4.18***	3.72***	3.78***	2.85***
	(0.05)	(0.15)	(0.07)	(0.19)	(0.07)	(0.20)	(0.07)	(0.20)	(0.05)	(0.14)	(0.07)	(0.18)
<i>N</i>	442	368	442	368	442	368	442	368	469	379	469	379
Adjusted <i>R</i> <sup>2</sup>	0.01	0.02	0.01	0.06	0.01	0.04	0.01	0.01	0.02	0.05	0.02	0.10

Standard errors in parentheses, \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ , source: Qualtrics Survey April 2023

## **Discussion:**

In this section, I discuss how this study found support, even if not statistically significant, for each theorized hypothesis. There were two types of dependent variables in order to be sure the study would be sensitive enough to find effects. There were three traditional policy acceptability questions and two policy prioritization questions. These two types of dependent variables measured different concepts and should not be interpreted the same way, but they both contribute to policy acceptance literature. To summarize the discussion, both anthropocentric and non-anthropocentric policy justifications effect policy acceptance as measured by acceptability and prioritization with statistical significance. This study found no statistically significant support for whether anthropocentric or non-anthropocentric justification is more effective.

*H1: Policy acceptance is higher when the policy is justified anthropocentrically than without justification.*

H1 could be accepted on grounds of prioritizing wildlife infrastructure compared to paving roads and improving road maintenance even when accounting for political identification. H1 was also statistically supported by the acceptability of building and spending taxes for wildlife infrastructure but this significance did not hold when including political identification in the analysis. I conclude that anthropocentric ethical policy justifications do indeed have an effect on policy acceptance but probably interact with political identification that future studies should explore. Interestingly, the effect of anthropocentric justification appeared stronger compared to no justification when asked to compare policies rather than merely accept policies. Anthropocentric justifications may provide comparative information for people to better justify their preferences.

*H2: Policy acceptance is higher when the policy is justified non-anthropocentrically than without justification.*

H2 found stronger statistical support than H1 in the study because building and spending taxes on wildlife infrastructure had statistical significance even when including political identification at a 99% significance level (compared to 95% for anthropocentric justification). These dependent variables were the most direct and valid measurement of policy acceptability, which indicates this study finds support for a new policy acceptance indicator. When participants were asked about a potential policy, they were the most supportive when the environmental policy was justified for non-anthropocentric reasons. The manipulation check question may provide

insight as to why this is the case because 78% of the control group responded the policy was being passed to “save animals’ lives” even without justification. Perhaps this implies the non-anthropocentric justification better matched participant’s predisposed reasons but this needs to be further explored.

*H3: Anthropocentric policy justifications increase policy acceptance more than non-anthropocentric policy justifications.*

This experiment found no statistical support for H3. However, findings, though insignificant, indicate that anthropocentric justification rather than non-anthropocentric increased policy prioritization for environmental policies. This is to say that when policy makers need to argue for environmental policies rather than an alternative, it would help them to use non-anthropocentric justification. This insight may be helpful when debating how to allocate funds between environment and other problems, but further research is necessary.

*H4: Non-anthropocentric policy justifications increase policy acceptance more than anthropocentric policy justifications.*

This experimental study found no statistical support for H4. That being said, results show that non-anthropocentric justifications were more effective in promoting policy acceptance than non-anthropocentric justifications when the environmental policy was not compared with a policy that did not pertain to the environment. Thus, when environmental policies are initially proposed and/or once they are passed, it might help politicians and policy makers to use non-anthropocentric justifications to promote policy acceptance.

Study limitations:

There are a number of reasons that H3 and H4 found no statistical support in this study. First, the American context provided a valid policy case with a non-anthropocentric aim (saving animals’ lives and mitigating biodiversity loss) but the cultural context may have limited the effect of justifications. There are other cultures where the effects of non-anthropocentric justifications might strengthen; especially if previous effective policies have been implemented on those grounds. I can imagine a country like New Zealand which has granted personhood legal rights to natural entities like rivers (Perry 2022) may be affected differently by non-anthropocentric justifications because they have already begun to move environmental concerns from the economic to social policy realm.



Based on the large sample and power of this study, I can say with confidence that the manipulation was strong enough to show justification effects compared to control, but perhaps the manipulation was not strong enough between treatments. If one thinks of the treatment like a dosage, one can say with certainty this dosage was strong enough to show some medication matters but we cannot determine the exact type and amount of medicine yet. Perhaps a later iteration of this study could use pictures of tourism for anthropocentric treatment and animals for non-anthropocentric treatment to increase the emotional response. This emotional response might trigger a stronger policy acceptance effect between justifications.

Lastly, the case was largely chosen on grounds of being an apolitical non-anthropocentric policy issue. This was a way to control for partisanship; however, it is possible that a more divisive case may be better for comparing anthropocentric to non-anthropocentric treatment in order to sense stronger effects between treatment. In the future, pilot studies could test more policy cases in to identify one with lower ceiling effects.

Policy implications from this study are quite limited because findings may not generalize beyond the United States and the sample lacks rural representation within the US. This case is quite a specific form of conservation and environmental spending chosen on grounds of bipartisanship. Wildlife infrastructure is only one of many environmental policies necessary to effectively promote conservation or prevent further biodiversity loss. This being said, this study's findings indicate further research should be pursued regarding ethical justifications. Perhaps the effects of ethical justifications are amplified by more complicated policies regarding climate change or conservation and moderate or interact with other policy acceptance factors. Policy ethical justification may also have implications more broadly in human rights policies and other social policy that cannot be quantified or easily compared by cost benefit analysis. Once ethical justification is fully explored, politicians and policy makers may be able to pass more diverse and creative policies on behalf of the environment and society.

## **Conclusion:**

The aim of this study was twofold in order to answer the following questions: (1) *What effects do anthropocentric and non-anthropocentric ethical justifications have on policy acceptance?* (2) *Do anthropocentric or non-anthropocentric justifications better promote environmental policy acceptance?* I theorized four hypotheses, two of which found statistical

support. I succeeded in answering the first of these questions by conducting an online experimental survey based on wildlife infrastructure implemented in Colorado, USA. The data showed that both anthropocentric and non-anthropocentric justifications promote policy acceptance. This study was unable to answer the second question with statistical significance potentially because of ceiling effects and the manipulation may not have been strong enough to produce a sufficient effect size between treatments.

In practice, policy makers use anthropocentric and non-anthropocentric justifications in conjunction (as seen in the Colorado bill text that this experiment was based on). In the future, researchers should further isolate which justifications have a policy acceptance effect in order to promote public compliance, policy effectiveness, and government legitimacy. This study could also be conducted in other contexts to determine whether the effect is amplified or diminished by socio-political contexts.

The findings presented here contribute to policy acceptance research by borrowing concepts from ethical philosophers. These empirical results show that policies promoted with non-anthropocentric justifications do indeed lead to policy acceptance, suggesting that “environmental pragmatists” like Norton may be wrong in their assumption that anthropocentric justifications are the best way to pass and promote policy. These findings also indicate that anthropocentric justifications are more effective when people have to choose which policy to prioritize. This is to say that both anthropocentric and non-anthropocentric justifications have an impact and may be more effective at different stages of the policy process.

This study suggests that policy justification is a policy acceptance factor that should be further explored. First, the present study did not attempt to address how ethical justification may interact with other established policy acceptance indicators like personal values, political ideology, and context; these interactions may be a fruitful area of exploration. Second, further research is warranted to explore what psychological predispositions contribute to when the policy justification is most effective. I, along with McShane (2007) and Velleman (1999), would argue that people have emotional orientations to the natural world which might help illuminate how and why people are affected by non-anthropocentric justification. The findings presented in this study have broad implications for other policy realms such as human rights and public health where people must act against their self-interest and where the ethical justification may provide a higher reason to act for the collective.

## Works Cited:

- Aasen, Marianne, and Arild Vatn. 2018. "Public Attitudes Toward Climate Policies: The Effect of Institutional Contexts and Political Values." *Ecological Economics* 146: 106–14.
- Abbey, James D., and Margaret G. Meloy. 2017. "Attention by Design: Using Attention Checks to Detect Inattentive Respondents and Improve Data Quality." *Journal of Operations Management* 53–56: 63–70.
- Adams, W. M. 2014. "The Value of Valuing Nature." *Science (American Association for the Advancement of Science)* 346(6209): 549–51.
- Aguinis, Herman, and Kyle J. Bradley. 2014. "Best Practice Recommendations for Designing and Implementing Experimental Vignette Methodology Studies." *Organizational Research Methods* 17(4): 351–71.
- Aguinis, Herman, Isabel Villamor, and Ravi S. Ramani. 2021. "MTurk Research: Review and Recommendations." *Journal of Management* 47(4): 823–37.
- Anderson, Monica. 2017. "For Earth Day 2017, Here's How Americans View Environmental Issues." *Pew Research Center*. <https://www.pewresearch.org/fact-tank/2017/04/20/for-earth-day-heres-how-americans-view-environmental-issues/> (March 22, 2023).
- Aneshensel, Carol. 2013. "Ruling Out Alternative Theoretical Explanations: Rival Independent Variables." In *Theory-Based Data Analysis for the Social Sciences*, Los Angeles, California: SAGE Publications, Inc. <https://methods.sagepub.com/book/theory-based-data-analysis-for-the-social-sciences-2e> (May 3, 2023).
- Arechar, Antonio A., Simon Gächter, and Lucas Molleman. 2018. "Conducting Interactive Experiments Online." *Experimental Economics* 21(1): 99–131.
- Atzmüller, Christiane, and Peter M. Steiner. 2010. "Experimental Vignette Studies in Survey Research." *Methodology* 6(3): 128–38.
- Barry, Brian. 1999. "Sustainability and Intergenerational Justice." In *Fairness and Futurity*, Oxford: University Press.
- Becker, C. Dustin, and Elinor Ostrom. 1995. "Human Ecology and Resource Sustainability: The Importance of Institutional Diversity." *Annual Review of Ecology and Systematics* 26: 113–33.
- Beier, Paul, and Reed F. Noss. 1998. "Do Habitat Corridors Provide Connectivity?" *Conservation Biology* 12(6): 1241–52.
- Bergquist, Magnus, and Andreas Nilsson. 2016. "I Saw the Sign: Promoting Energy Conservation via Normative Prompts." *Journal of Environmental Psychology* 46: 23–31.

- Bergquist, Magnus, Andreas Nilsson, Niklas Haring, and Sverker C. Jagers. 2022. "Meta-Analyses of Fifteen Determinants of Public Opinion about Climate Change Taxes and Laws." *Nature Climate Change* 12(3): 235–40.
- Bohner, Gerd, and Nina Dickel. 2011. "Attitudes and Attitude Change." *Annual Review of Psychology* 62: 391–417.
- Brennan, Andrew, and Norva Y. S. Lo. 2022. "Environmental Ethics." In *The Stanford Encyclopedia of Philosophy*, ed. Edward N. Zalta. Metaphysics Research Lab, Stanford University. <https://plato.stanford.edu/archives/sum2022/entries/ethics-environmental/> (January 11, 2023).
- Butchart, Stuart H. M. et al. 2012. "Protecting Important Sites for Biodiversity Contributes to Meeting Global Conservation Targets." *PLOS ONE* 7(3): e32529.
- Callicott, J. Baird. 1984. "Non-Anthropocentric Value Theory and Environmental Ethics." *American Philosophical Quarterly* 21(4): 299–309.
- Cardinale, Bradley J. et al. 2012. "Biodiversity Loss and Its Impact on Humanity." *Nature* 486(7401): 59–67.
- Carson, Rachel. 2022. *Silent Spring*. 40th anniversary. Boston: Mariner Books.
- Coffin, Alisa W. 2007. "From Roadkill to Road Ecology: A Review of the Ecological Effects of Roads." *Journal of Transport Geography* 15(5): 396–406.
- Cook, Karen S., and Bogdan State. 2017. "Trust and Social Dilemmas: A Selected Review of Evidence and Applications." In *Trust in Social Dilemmas*, New York: Oxford University Press. (March 21, 2022).
- Davidovic, Dragana, Niklas Haring, and Sverker C. Jagers. 2020. "The Contingent Effects of Environmental Concern and Ideology: Institutional Context and People's Willingness to Pay Environmental Taxes." *Environmental Politics* 29(4): 674–96.
- Dietz, Thomas, Nives Dolšak, Elinor Ostrom, and Paul C. Stern. 2002. "The Drama of the Commons." In *The Drama of the Commons*, Washington, DC, US: National Academy Press, 3–35.
- Douglas, Benjamin D., Patrick J. Ewell, and Markus Brauer. 2023. "Data Quality in Online Human-Subjects Research: Comparisons between MTurk, Prolific, CloudResearch, Qualtrics, and SONA." *PLOS ONE* 18(3): e0279720.
- Drews, Stefan, and Jeroen C.J.M. van den Bergh. 2016. "What Explains Public Support for Climate Policies? A Review of Empirical and Experimental Studies." *Climate Policy* 16(7): 855–76.
- Dülmer, Hermann. 2016. "The Factorial Survey: Design Selection and Its Impact on Reliability and Internal Validity." *Sociological Methods & Research* 45(2): 304–47.

- Ejelöv, Emma et al. 2022. "Push, Pull, or Inform - an Empirical Taxonomy of Environmental Policy Support in Sweden." *Journal of Public Policy* 42(3): 529–52.
- Ejelöv, Emma, and Andreas Nilsson. 2020. "Individual Factors Influencing Acceptability for Environmental Policies: A Review and Research Agenda." *Sustainability* 12(6): 2404.
- Eliasson, Jonas, and Lina Jonsson. 2011. "The Unexpected 'Yes': Explanatory Factors behind the Positive Attitudes to Congestion Charges in Stockholm." *Transport Policy* 18(4): 636–47.
- Eriksson, Louise, Jörgen Garvill, and Annika M. Nordlund. 2008. "Acceptability of Single and Combined Transport Policy Measures: The Importance of Environmental and Policy Specific Beliefs." *Transportation Research Part A: Policy and Practice* 42(8): 1117–28.
- Fairbrother, Malcolm. 2016. "Trust and Public Support for Environmental Protection in Diverse National Contexts." *Sociological Science* 3: 359–82.
- Fairbrother, Malcolm, Ingemar Johansson Sevä, and Joakim Kulin. 2019. "Political Trust and the Relationship between Climate Change Beliefs and Support for Fossil Fuel Taxes: Evidence from a Survey of 23 European Countries." *Global Environmental Change* 59: 102003.
- Feinberg, Matthew, and Robb Willer. 2013. "The Moral Roots of Environmental Attitudes." *Psychological Science* 24(1): 56–62.
- Field, Andy. 2017. *Discovering Statistics Using IBM SPSS Statistics*. SAGE.
- Forman, Richard T. T., and Lauren E. Alexander. 1998. "Roads and Their Major Ecological Effects." *Annual Review of Ecology and Systematics* 29: 207-C2.
- Funk, Cary, and Meg Hefferon. 2019. "U.S. Public Views on Climate and Energy." *Pew Research Center Science & Society*. <https://www.pewresearch.org/science/2019/11/25/u-s-public-views-on-climate-and-energy/> (March 22, 2023).
- Gifford, Robert. 2011. "The Dragons of Inaction: Psychological Barriers That Limit Climate Change Mitigation and Adaptation." *American Psychologist* 66(4): 290–302.
- Grisolía, José M., Francisco López, and Juan de Dios Ortúzar. 2015. "Increasing the Acceptability of a Congestion Charging Scheme." *Transport Policy* 39: 37–47.
- de Groot, Judith I. M., and Geertje Schuitema. 2012. "How to Make the Unpopular Popular? Policy Characteristics, Social Norms and the Acceptability of Environmental Policies." *Environmental Science & Policy* 19–20: 100–107.
- Hardin, Garrett. 1968. "The Tragedy of the Commons." *Science*. <https://www.science.org/doi/abs/10.1126/science.162.3859.1243> (January 19, 2022).
- Harring, Niklas. 2013. "Understanding the Effects of Corruption and Political Trust on Willingness to Make Economic Sacrifices for Environmental Protection in a Cross-National Perspective." *Social Science Quarterly* 94(3): 660–71.

- . 2016. “Reward or Punish? Understanding Preferences toward Economic or Regulatory Instruments in a Cross-National Perspective.” *Political Studies* 64(3): 573–92.
- Harring, Niklas, and Sverker C. Jagers. 2013. “Should We Trust in Values? Explaining Public Support for Pro-Environmental Taxes.” *Sustainability* 5(1): 210–27.
- Harring, Niklas, Sverker C. Jagers, and Simon Matti. 2017. “Public Support for Pro-Environmental Policy Measures: Examining the Impact of Personal Values and Ideology.” *Sustainability* 9(5): 679.
- . 2019. “The Significance of Political Culture, Economic Context and Instrument Type for Climate Policy Support: A Cross-National Study.” *Climate Policy* 19(5): 636–50.
- Hauser, David J. et al. 2022. “Evaluating CloudResearch’s Approved Group as a Solution for Problematic Data Quality on MTurk.” *Behavior Research Methods*. <https://doi.org/10.3758/s13428-022-01999-x> (April 12, 2023).
- Hauser, David J., and Norbert Schwarz. 2016. “Attentive Turkers: MTurk Participants Perform Better on Online Attention Checks than Do Subject Pool Participants.” *Behavior Research Methods* 48(1): 400–407.
- Hauser, David J., Phoebe C. Ellsworth, and Richard Gonzalez. 2018. “Are Manipulation Checks Necessary?” *Frontiers in Psychology* 9. <https://www.frontiersin.org/articles/10.3389/fpsyg.2018.00998> (March 29, 2023).
- Hobbs, Richard J. 1992. “The Role of Corridors in Conservation: Solution or Bandwagon?” *Trends in Ecology & Evolution* 7(11): 389–92.
- Howard, Christopher. 2023. “Fitting Attitude Theories of Value.” In *The Stanford Encyclopedia of Philosophy*, eds. Edward N. Zalta and Uri Nodelman. Metaphysics Research Lab, Stanford University. <https://plato.stanford.edu/archives/spr2023/entries/fitting-attitude-theories/> (January 31, 2023).
- Inglehart, Ronald F. 2008. “Changing Values among Western Publics from 1970 to 2006.” *West European politics* 31(1–2): 130–46.
- Jagers, Sverker C. et al. 2020. “On the Preconditions for Large-Scale Collective Action.” *Ambio* 49(7): 1282–96.
- Jagers, Sverker C., Niklas Harring, and Simon Matti. 2018. “Environmental Management from Left to Right – on Ideology, Policy-Specific Beliefs and pro-Environmental Policy Support.” *Journal of Environmental Planning and Management* 61(1): 86–104.
- Johansson Sevä, Ingemar, and Joakim Kulin. 2018. “A Little More Action, Please: Increasing the Understanding about Citizens’ Lack of Commitment to Protecting the Environment in Different National Contexts.” *International Journal of Sociology* 48(4): 314–39.

- Jones, Jeffrey. 2022. "U.S. Political Party Preferences Shifted Greatly During 2021." *Gallup.com*. <https://news.gallup.com/poll/388781/political-party-preferences-shifted-greatly-during-2021.aspx> (May 1, 2023).
- Jonsen, Albert R., and Lewis H. Butler. 1975. "Public Ethics and Policy Making." *The Hastings Center Report* 5(4): 19–31.
- Kim, Junghwa, Jan-Dirk Schmöcker, Satoshi Fujii, and Robert B. Noland. 2013. "Attitudes towards Road Pricing and Environmental Taxation among US and UK Students." *Transportation Research Part A: Policy and Practice* 48: 50–62.
- Kulin, Joakim, and Ingemar Johansson Sevä. 2019. "The Role of Government in Protecting the Environment: Quality of Government and the Translation of Normative Views about Government Responsibility into Spending Preferences." *International Journal of Sociology* 49(2): 110–29.
- Kyselá, Eva, Milan Ščasný, and Iva Zvěřinová. 2019. "Attitudes toward Climate Change Mitigation Policies: A Review of Measures and a Construct of Policy Attitudes." *Climate Policy* 19(7): 878–92.
- Leopold, Aldo. 1968. *A Sand County Almanac and Sketches Here and There*. 2nd edition. New York usw: Oxford University Press.
- Light, Andrew, and Eric Katz. 1996. "Introduction: Environmental Pragmatism and Environmental Ethics as Contested Terrain." In *Environmental Pragmatism*, Environmental Philosophies Series, New York: Routledge, 1–18.
- Lipske, Michael. 1999. "How Rachel Carson Helped Save The Brown Pelican." *National Wildlife Federation*. <https://www.nwf.org/Home/Magazines/National-Wildlife/2000/How-Rachel-Carson-Helped-Save-The-Brown-Pelican> (October 4, 2022).
- Mace, Georgina M. et al. 2014. "Approaches to Defining a Planetary Boundary for Biodiversity." *Global Environmental Change* 28: 289–97.
- Maestre-Andrés, Sara, Stefan Drews, and Jeroen van den Bergh. 2019. "Perceived Fairness and Public Acceptability of Carbon Pricing: A Review of the Literature." *Climate Policy* 19(9): 1186–1204.
- Magnusson, Kristoffer. "Interpreting Cohen's d." <https://rpsychologist.com/cohend/> (May 3, 2023).
- Mansbridge, Jane. 2014a. "The Role of the State in Governing the Commons." *Environmental Science & Policy* 36: 8–10.
- . 2014b. "What Is Political Science For?" *Perspectives on Politics* 12(1): 8–17.
- Mastroianni, Anna C., Jeffrey P. Kahn, and Nancy E. Kass. 2019. *The Oxford Handbook of Public Health Ethics*. Oxford University Press.

- Matti, Simon. 2015. "Climate Policy Instruments." In *Research Handbook on Climate Governance*, eds. Karin Bäckstrand and Eva Lövbrand. Cheltenham: Edward Elgar Publishing, 400–410.
- McShane, Katie. 2007a. "Anthropocentrism vs. Nonanthropocentrism: Why Should We Care?" *Environmental Values* 16(2): 169–85.
- . 2007b. "Why Environmental Ethics Shouldn't Give Up on Intrinsic Value." *Environmental Ethics* 29(1): 43–61.
- Mullinix, Kevin J., Thomas J. Leeper, James N. Druckman, and Jeremy Freese. 2015. "The Generalizability of Survey Experiments\*." *Journal of Experimental Political Science* 2(2): 109–38.
- Naess, Arne. 2008. "The Shallow and the Deep, Long-Range Ecology Movement. A Summary\*." In *The Ethics of the Environment*, Routledge.
- Niebuhr, Reinhold. 2013. *Moral Man and Immoral Society: A Study in Ethics and Politics*. Westminster John Knox Press.
- Nilsson, Andreas, André Hansla, et al. 2016. "Public Acceptability towards Environmental Policy Measures: Value-Matching Appeals." *Environmental Science & Policy* 61: 176–84.
- Nilsson, Andreas, Geertje Schuitema, et al. 2016. "The Road to Acceptance: Attitude Change before and after the Implementation of a Congestion Tax." *Journal of Environmental Psychology* 46: 1–9.
- Norton, Bryan G. 1984. "Environmental Ethics and Weak Anthropocentrism." *Environmental Ethics* 6(2): 131–48.
- . 1995. *Towards Unity Among Environmentalists*. New York: Oxford University Press.
- Nyborg, Karine. 2014. "Project Evaluation with Democratic Decision-Making: What Does Cost–Benefit Analysis Really Measure?" *Ecological Economics* 106: 124–31.
- O'Neill, Aaron. 2023. "United States - Age Distribution 2021." *Statista*. <https://www.statista.com/statistics/270000/age-distribution-in-the-united-states/> (May 11, 2023).
- Palan, Stefan, and Christian Schitter. 2018. "Prolific.Ac—A Subject Pool for Online Experiments." *Journal of Behavioral and Experimental Finance* 17: 22–27.
- Pearce, David, Giles Atkinson, and Susana Mourato. 2006. *Cost-Benefit Analysis and the Environment: Recent Developments*. Paris: Organization for Economic Cooperation & Development.



- Peters, B. Guy, Jon Pierre, and Christoph Knill, eds. 2006. "Environmental Policy." In *Handbook of Public Policy*, London, UNITED KINGDOM: SAGE Publications, Limited, 249–64. <http://ebookcentral.proquest.com/lib/gu/detail.action?docID=1023934> (January 13, 2023).
- Povitkina, Marina, and Simon Matti. 2021. "Quality of Government and Environmental Sustainability." In *The Oxford Handbook Of The Quality Of Government, 2021*, <https://doi.org/10.1093/oxfordhb/9780198858218.013.20> (February 2, 2022).
- Rabinowicz, Wlodek, and Toni Rønnow-Rasmussen. 2006. "Buck-Passing and the Right Kind of Reasons." *The Philosophical Quarterly* (1950-) 56(222): 114–20.
- Sagoff, Mark. 1984. "Animal Liberation and Environmental Ethics: Bad Marriage, Quick Divorce Law and Ecological Ethics Symposium." *Osgoode Hall Law Journal* 22(2): 297–308.
- . 1991. "Zuckerman's Dilemma: A Plea for Environmental Ethics." *The Hastings Center Report* 21(5): 32–40.
- . 1998. *The Economy of the Earth: Philosophy, Law, and the Environment*. 1st ed. Cambridge: Cambridge University Press. <https://www.cambridge.org/core/books/economy-of-the-earth/D55E87B7AA1437E9A555887A321E0B55> (January 31, 2023).
- Saner, Marc A. 2000. "Biotechnology, the Limits of Norton's Convergence Hypothesis, and Implications for an Inclusive Concept of Health." *Ethics and the Environment* 5(2): 229–41.
- Schwartz, Shalom H. 2012. "Basic Human Values: An Overview." *Online Readings in Psychology and Culture* 2(1). <http://dx.doi.org/10.9707/2307-0919.1116>.
- Shutkin, William A. 2001. *The Land That Could Be: Environmentalism and Democracy in the Twenty-First Century*. Reprint edition. The MIT Press.
- Simberloff, Daniel, and James Cox. 1987. "Consequences and Costs of Conservation Corridors." *Conservation Biology* 1(1): 63–71.
- Singer, Peter. 1975. *Animal Liberation: A New Ethics for Our Treatment of Animals*. Jonathan Cape.
- Sjöstedt, Martin. 2014. "Enforcement and Compliance in African Fisheries." In *State and Environment: The Comparative Study of Environmental Governance*, MIT Press.
- Smith, E. Keith, and Adam Mayer. 2018. "A Social Trap for the Climate? Collective Action, Trust and Climate Change Risk Perception in 35 Countries." *Global Environmental Change* 49: 140–53.
- Stein, Jana von. 2022. "Democracy, Autocracy, and Everything in Between: How Domestic Institutions Affect Environmental Protection." *British Journal of Political Science* 52(1): 339–57.

- Steinberg, Paul F. 2009. "Institutional Resilience Amid Political Change: The Case of Biodiversity Conservation." *Global Environmental Politics* 9(3): 61–81.
- Steiner, Peter M., Christiane Atzmüller, and Dan Su. 2016. "Designing Valid and Reliable Vignette Experiments for Survey Research: A Case Study on the Fair Gender Income Gap." *Journal of Methods and Measurement in the Social Sciences* 7(2): 52–94.
- Steverson, Brian K. 1995. "Contextualism and Norton's Convergence Hypothesis." *Environmental Ethics* 17(2): 135–50.
- Tam, Kim-Pong, and Hoi-Wing Chan. 2018. "Generalized Trust Narrows the Gap between Environmental Concern and Pro-Environmental Behavior: Multilevel Evidence." *Global Environmental Change* 48: 182–94.
- "U.S. Census Bureau QuickFacts: United States." 2023. <https://www.census.gov/quickfacts/fact/table/US/PST045221> (May 1, 2023).
- Velleman, J. David. 1999. "Love as a Moral Emotion." *Ethics* 109(2): 338–74.
- Wason, Kelly D., Michael J. Polonsky, and Michael R. Hyman. 2002. "Designing Vignette Studies in Marketing." *Australasian Marketing Journal* 10(3): 41–58.
- Watson, James E. M., Nigel Dudley, Daniel B. Segan, and Marc Hockings. 2014. "The Performance and Potential of Protected Areas." *Nature* 515(7525): 67–73.
- Weinberg, Jill, Jeremy Freese, and David McElhattan. 2014. "Comparing Data Characteristics and Results of an Online Factorial Survey between a Population-Based and a Crowdsourced Sample." *Sociological Science* 1: 292–310.
- Wiedmaier, Benjamin. 2017. "Statistical Power Analysis." In *The SAGE Encyclopedia of Communication Research Methods*, SAGE Publications, Inc. <https://methods.sagepub.com/reference/the-sage-encyclopedia-of-communication-research-methods> (May 3, 2023).
- Will, Perry, and Jessie Danielson. 2021. (Colorado General Assembly) *Colorado Habitat Connectivity*.
- Willott, Elizabeth, and David Schmidtz. 2002. "The Dawn of Civilization." *Oxford University Press*. <http://research.biology.arizona.edu/mosquito/willott/323/intro.html> (October 4, 2022).
- Wilson, James. 2002. "Scientific Uncertainty, Complex Systems, and the Design of Common-Pool Institutions." In *The Drama of the Commons*, Washington, DC, US: National Academy Press, 327–59.

## Appendices:

### Colorado Bill: Senate Joint Resolution 21-021

BY SENATOR(S) Danielson, Bridges, Buckner, Donovan, Fenberg, Ginal, Hansen, Jaquez Lewis, Kolker, Moreno, Pettersen, Priola, Story, Winter, Zenzinger, Garcia; also REPRESENTATIVE(S) Will, Amabile, Bernett, Bird, Carver, Catlin, Cutter, Daugherty, Duran, Geitner, Gonzales-Gutierrez, Herod, Hooton, Jackson, Jodeh, Kipp, Lynch, McCluskie, McCormick, McLachlan, Mullica, Pico, Ricks, Roberts, Sandridge, Snyder, Titone, Valdez D., Van Beber, Young.

CONCERNING THE GENERAL ASSEMBLY'S SUPPORT OF THE STATE OF COLORADO'S EFFORTS TO PRESERVE THE STATE'S FLORA AND FAUNA THROUGH THE PROTECTION OF WILDLIFE HABITAT CONNECTIVITY.

WHEREAS, Colorado's natural environment and numerous native plant and wildlife species contribute greatly to the economy and play a vital role in ensuring a sustainable future for current and future generations of Coloradans and enhancing their quality of life; and

WHEREAS, Sporting and outdoors enthusiasts and tourists from across the world visit Colorado to experience our state's outdoor landscapes and abundant wildlife; and

WHEREAS, Colorado boasts the largest Rocky Mountain elk herd in the world, which contains over 250,000 animals, and the state is also home to significant populations of other iconic big game species such as mule deer, bighorn sheep, pronghorn, and moose, as well as numerous other endemic wildlife species; and

WHEREAS, The 2019 Statewide Comprehensive Outdoor Recreation Plan reports that outdoor recreation contributes more than \$62 billion to the state's economy, and in 2017 employed about 511,000 people, was 2021 responsible for about one-tenth (\$35 billion) of the state's gross domestic product, and brought in \$9.4 billion in local, state, and federal tax revenue; and

WHEREAS, One in five species is at risk of extinction in the United States, and Colorado is home to 33 threatened or endangered species; and

WHEREAS, Changing climate conditions are exacerbating the existing pressures on the natural habitats of wildlife, and protecting wildlife corridors and maintaining connected habitats is recognized as one of the most ecologically effective climate adaptation and biodiversity conservation measures; and

WHEREAS, Intact habitats and intact wildlife corridors that connect those habitats are vital to ensuring that Colorado's wildlife populations continue to thrive; and

WHEREAS, Protecting wildlife corridors has been shown to improve the herd vitality of big game species that are critical to Colorado's outdoor recreation economy; and

WHEREAS, Wildlife corridors serve to connect wildlife habitat areas and allow for the movement, migration, and dispersal of native fish, wildlife, and plant species; and

WHEREAS, Wildlife corridors provide benefits to humans, including increased property values of land adjacent to wildlife corridors, increased food security, and additional ecosystem services such as pollination, carbon sequestration, erosion control, and air and water purification; and

WHEREAS, Colorado's population continues to grow, placing pressure on the natural habitats that wildlife depend upon for survival; habitat loss and fragmentation are major contributors to declines in populations of native fish and wildlife, particularly species that migrate annually between seasonal habitats; and roadways disrupt annual big game migration, and vehicular collisions with wildlife pose risks to people, property, and the animals that contribute so much to Colorado's reputation as a place to admire natural wonders; and

WHEREAS, In Colorado, nearly 4,000 vehicle crashes involving wildlife are reported to law enforcement every year, resulting in injuries and fatalities to humans and costing an estimated \$80 million annually; this figure does not include the value of wildlife killed in vehicular collisions, the impact on the health of wildlife populations, or the loss and fragmentation of the vibrant habitats wildlife call home; and

WHEREAS, Wildlife crossing structures built within important wildlife corridors increase public safety and are highly effective at reducing wildlife-vehicle collisions and the costs associated with those collisions; and

WHEREAS, The state of Colorado, through the governor's office and state agencies including the Colorado department of transportation (CDOT), the department of natural resources (DNR), Colorado parks and wildlife (CPW), as well as tribal governments, counties, federal agencies, and nongovernmental partners that represent academia, nonprofit organizations, and biological and engineering sciences, have all demonstrated commitments to protecting wildlife corridors and reducing wildlife-vehicle collisions; and

WHEREAS, These efforts are reflected in, among other policies, Colorado Executive Order (EO) D 2019011, "Conserving Colorado's Big Game Winter Range and Migration Corridors"; the CPW State Wildlife Action Plan; the CPW "Colorado Action Plan", the 2020 Colorado State Action Plan to implement U.S. Department of Interior Secretarial Order 3362: "Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors"; the Colorado Wildlife and Transportation Alliance, formed in 2018; the 2007 Western Governors' Association Wildlife Corridors Initiative and subsequent multistate efforts including the Critical Habitat Assessment Tool and CPW's collaboration with the New Mexico Department of Game and Fish to develop and implement a "decision support system" that will enable government decision-makers and others to identify crucial habitats and wildlife corridors along the states' border early in any planning process for development activities and energy projects; the "Colorado Habitat Stewardship Act of 2007" and implementing regulations that require oil and gas operators to review maps of sensitive wildlife habitats and restricted-use occupancy areas that are maintained by the Colorado Oil and Gas Conservation Commission to determine whether a proposed drilling location is within such an area;

the Eagle County Comprehensive Plan (2005); and the Summit County

WHEREAS, CPW has an existing statutory mandate to "maintain records of areas used by wildlife for migration purposes" (and make such information available upon request), section 33-3-105, C.R.S., and is required to collect scientific information necessary to fulfill its duty to protect wildlife habitats, section 33-1-110 (4), C.R.S.; and

WHEREAS, CDOT is already invested in wildlife crossing projects across the state including but not limited to: The U.S. 285 Nathrop Wildlife Crossing Project, completed in 2018; a partnership between the Southern Ute Indian Tribe, CDOT, and CPW to construct a big game overpass and underpass near the US 160/State Highway 151 intersection between Bayfield and Pagosa Springs; on State Highway 9, the construction of two overpass bridges, five underpasses, 20 miles of wildlife fencing, and over 60 wildlife escape ramps between Silverthorne and Kremmling; and the US 550-US 160 Connection Project that will install two landscape bridges to allow for wildlife movements and one large game underpass on US 550; and

WHEREAS, Dozens of Democratic and Republican state and local elected officials have signed letters calling for legislative action to conserve and restore habitat connectivity in Colorado; and

WHEREAS, In 2020, the Colorado House of Representatives introduced a tribute recognizing the state's leadership in advancing wildlife connectivity and calling for increased efforts to reconnect priority landscapes, conserve migration routes for big game and other species, and ensure habitat protection through partnerships, planning, and policies; and

WHEREAS, Legislation to increase funding available for wildlife-vehicle collision mitigation measures and legislation to protect wildlife corridors are under consideration in both the U.S. House of Representatives and Senate, and such legislation would contribute to highway safety, protect wildlife corridors on federal land holdings within the state, and provide a source of revenue to the state to protect wildlife corridors and pursue highway mitigation projects; and

WHEREAS, Comprehensive identification, designation, and protection of wildlife corridors is a crucial strategy for bolstering Colorado's ecosystem resiliency and for ensuring the long-term viability of wildlife populations and communities; and

WHEREAS, Wildlife corridors are not bounded by property ownership or administrative boundaries, and therefore their protection requires recognition of private property rights and negotiations between different sovereigns (tribal, states, federal) and land managers (federal, tribal, state, county, municipal, and private); and

WHEREAS, Understanding the state's habitat connectivity status and potential would benefit from consideration of all relevant data, including data from federal, tribal, and state agencies and surrounding states, nonprofit organizations, universities, and private landowners; and

WHEREAS, Many state agencies, nonprofit organizations, and coalitions, as well as public-private partnerships, that are interested in advancing connectivity across this state and in surrounding states could benefit from a science-based understanding of current and potential wildlife corridors; and

WHEREAS, Protecting wildlife habitats and wildlife corridors requires significant financial investments, and the effectiveness and cost-efficiency of all the existing efforts in the state would be enhanced by a comprehensive and coordinated effort; now, therefore,

*Be It Resolved by the Senate of the Seventy-third General Assembly of the State of Colorado) the House of Representatives concurring herein:*

That the general assembly:

- Supports EO D 2019 011 and its mandates;
- Recommends the development of a working group including representatives of CPW, DNR, CDOT, other affected agencies, the governor's office, tribal nations and communities, sporting organizations, wildlife conservation organizations, the outdoor recreation industry, private landowners, insurance companies, and other stakeholders, to consider and develop policy proposals to assist in the implementation of EO D 2019 011 and to assist the legislature in crafting legislation necessary to support the governor's vision and protect wildlife corridors across the state of Colorado;
- Encourages CPW, in coordination with DNR and CDOT, pursuant to its mandate under section 33-3-105, C.R.S., to extend the scope of activity under EO D 2019 011 to develop or collect data regarding the relationship of all wildlife habitat areas and the connectivity of those areas for all game and nongame species. CPW is encouraged to use the data to develop a plan to provide guidance for state agency decisions and future policymaking and to develop targets for the designation and protection of wildlife corridors. CPW is encouraged to design the plan to preserve long-term habitat connectivity for all native fish, wildlife, and plant species to facilitate natural movements, migration, dispersal, safe road crossing, genetic exchange, and adaptation to climate and other environmental changes; and
- Supports the 2019 federal "Wildlife Corridors Conservation Act" and programs included in 2020 federal transportation legislation (S. 2302 and H.R. 2) that would provide funding for states to build wildlife crossing structures and implement other measures to reduce wildlife-vehicle collisions, and urges Colorado's congressional delegation to support these provisions.

*Be It Further Resolved,* That copies of this Joint Resolution be sent to U.S. Secretary of Agriculture Tom Vilsack; U.S. Secretary of the Interior Deb Haaland; U.S. Secretary of Transportation Pete Buttigieg; each member of Colorado's congressional delegation; the Colorado Municipal League; Colorado Counties, Inc.; and the Colorado City and County Management Association, and that these entities be requested to share the resolution with the relevant planning commissions and highway authorities.

## Qualtrics Survey April 2023

Your participation in this study is voluntary. No one will be able to identify you or your answers, and no one will know whether or not you participated in the study. You may exit the survey at any time and you are free to decline to answer any particular question you do not wish to answer for any reason. This is very important. Hence, before we start, we would like to highlight the following:

**STUDY DESCRIPTION:** The purpose of this study is to investigate people's opinions of local environmental infrastructure. The investigation is carried out by researchers at the Department of Political Science at the University of Gothenburg, Sweden.

**RISKS and BENEFITS:** There are no foreseeable risks or discomforts to you in participating. There are no direct benefits that will come to you for participating in this survey. However, your participation will be of scientific value by contributing to our understanding of how people form attitudes.

**COMPENSATION:** You will receive compensation for participating in this research. This money will be paid upon completion of the survey.

**CONFIDENTIALITY:** Safeguards are taken to maintain the confidentiality of your data. The data will be stored after the termination of the current research for a period of up to 10 years, and identifying information about participants will NOT be stored along with the rest of the data. This research project is headed by a master's student under advice of two associate professors. Kindly, Lauren Yehle  
gusyehlla@student.gu.se

### **Control:**

In 2021, Colorado passed a Wildlife Corridor Connectivity Bill to build wildlife crossings between open spaces. It includes overpass bridges, underpasses, fencing, escape ramps, and two landscape bridges. The bill's prime sponsors were one republican and one democrat; it was passed by republicans, democrats, and independents with 4 no votes in the state house. Your state government wants to pass similar wildlife infrastructure and we will ask you about your opinion even if this is a new proposal to you.

### **Anthropocentric Treatment:**

In 2021, Colorado passed a Wildlife Corridor Connectivity Bill to build wildlife crossings between open spaces. It includes overpass bridges, underpasses, fencing, escape ramps, and two landscape bridges. The bill's prime sponsors were one republican and one democrat; it was passed by republicans, democrats, and independents with 4 no votes in the state house. Your state government wants to pass similar wildlife infrastructure and we will ask you about your opinion even if this is a new proposal to you.

This bill is being passed because hitting wildlife is dangerous for people and costly to clean up. This bill would increase property values of the land adjacent to wildlife corridors, increase food

security, and improve ecosystem services to enhance human quality of life. This bill's primary purpose is to **improve the tourism economy and public road safety.**

**Non-anthropocentric treatment:**

In 2021, Colorado passed a Wildlife Corridor Connectivity Bill to build wildlife crossings between open spaces. It includes overpass bridges, underpasses, fencing, escape ramps, and two landscape bridges. The bill’s prime sponsors were one republican and one democrat; it was passed by republicans, democrats, and independents with only 4 no votes in the state house. Your state government wants to pass similar wildlife infrastructure and we will ask you about your opinion even if this is a new proposal to you.

This bill is being passed because habitat loss and fragmentation are major contributors to declines in populations of native wildlife. Maintaining connected habitats is recognized as one of the most effective biodiversity conservation measures. This bill would connect habitats to promote movement, migration, and dispersal of native wildlife and plant species. The bill’s primary purpose is to **prevent habitat and biodiversity loss by saving wildlife from vehicle collisions.**

What is your opinion of the following proposals by your local government where 1 is strongly against and 5 is strongly in favor?

	Strongly against	Neither in favor or against		Strongly in favor	
	1	2	3	4	5
Building wildlife infrastructure					
Spending tax money to build wildlife infrastructure					
Implementing a road toll where the wildlife infrastructure is located					

How much do you prefer wildlife infrastructure compared to paving country roads and passes?

- Strongly in favor of paving country roads
- Somewhat prefer paving country roads
- Equally prefer both
- Somewhat prefer wildlife infrastructure
- Strongly in favor of wildlife infrastructure

How much do you prefer wildlife infrastructure compared to improving road maintenance (potholes, signage repair, proper drainage, etc)?

- Strongly in favor of better road maintenance
- Somewhat prefer better road maintenance
- Equally prefer both
- Somewhat prefer wildlife infrastructure
- Strongly in favor of wildlife infrastructure



This question is not asking for your opinion. What do you perceive is the purpose of this wildlife infrastructure?

- Improve the economy and make roads safer for people
- Save animals' lives
- Build beautiful infrastructure

What is your sex?

- Male
- Female
- Prefer not to answer

How old are you?

- Under 18
- 18-24 years old
- 25-34 years old
- 35-44 years old
- 45-54 years old
- 55-64 years old
- 65+ years old

What is the highest level of school you have completed or the highest degree you have received?

- Less than high school degree
- High school graduate (high school diploma or equivalent including GED)
- Some college but no degree
- Associate degree in college (2-year)
- Bachelor's degree in college (4-year)
- Master's degree
- Doctoral degree
- Professional degree (JD, MD)

Choose one or more races that you consider yourself to be:

- White
- Black or African American
- American Indian or Alaska Native
- Asian
- Native Hawaiian or Pacific Islander
- Other \_\_\_\_\_

Are you Spanish, Hispanic, or Latino or none of these?

- Spanish
- Hispanic
- Latino
- None of these

This is an attention check. Please write the word "check" in the box below.

In which state do you currently reside?

▼ Alabama (1) ... I do not reside in the United States (53)

Please describe in what type of area you live.

- Big City, Central
- Big City, Fringe/Suburb
- City or Large Town, Central
- City or Large Town, Fringe/Suburb
- Small Town
- Rural

Generally speaking, how do you think of yourself politically?

- Republican
- Democrat
- Independent
- Other \_\_\_\_\_
- No preference

Do you think of yourself as closer to the Republican or Democratic party?

- Republican
- Democratic

## Summary Statistics of Demographics

Table 7: Summary Statistics

	<i>Control</i>	<i>Anthropocentric (A) Treatment</i>	<i>Non- Anthropocentric (NA) Treatment</i>	<i>Total</i>	<i>American Public</i>
<i>n (sample size)</i>	240	202	229	671	
<b>Sex</b>					
<i>Male</i>	53	51	54	53	49*
<i>Female</i>	46	45	43	45	51*
<b>Age</b>					
<i>Under 18 years old</i>	0	0	.44	.15	22*
<i>18-24 years old</i>	8	11	12	10	9
<i>25-34 years old</i>	30	37	36	34	14**
<i>35-44 years old</i>	29	23	22	25	13**
<i>45-54 years old</i>	15	16	17	16	12**

<i>55-64 years old</i>	13	6	8	9	13**
<i>65+ years old</i>	6	7	5	6	17**
<b>Education</b>					
<i>Less than high school</i>	.83	.99	.44	.75	11.1*
<i>High School graduate (or GED)</i>	13	13	10	12	
<i>Some college but no degree</i>	20	21	22	21	
<i>Associate Degree</i>	11	8	12	10	
<i>Bachelor's Degree</i>	40	36	42	39	34* (or higher)
<i>Master's Degree</i>	12	12	10	11	
<i>Doctoral Degree</i>	.83	6	2	3	
<i>Professional (JD or MD)</i>	3	2	2	3	
<b>Race and Ethnicity</b>					
<i>White</i>	73	75	64	71	76*
<i>Black or African American</i>	6	5	10	7	14*
<i>American Indian or Alaska Native</i>	.42	0	.87	.45	1*
<i>Asian</i>	14	12	16	.45	6.1*
<i>Pacific Islander</i>	.42	.5	.44	.45	.3*
<i>Spanish/Hispanic/Latino</i>	8	10	12	10	19*
<i>Mixed: more than 1 selected</i>	4	5	4	4	3*
<b>Location</b>					
<i>Big City, Central</i>	14	13	9	12	
<i>Big City, Fringe/Suburb</i>	17	19	19	18	
<i>City or Large Town, central</i>	14	9	17	14	
<i>City or Large Town, fringe/suburb</i>	30	31	26	29	
<i>Small Town</i>	18	16	19	18	
<i>Rural</i>	7	10	8	8	20*
<b>Political Identification</b>					
<i>Republican</i>	18	16	12	15	28***
<i>Republican Leaning</i>	17	11	15	15	19***
<i>Democrat</i>	45	59	55	53	28***
<i>Democrat Leaning</i>	13	18	17	20	14***

All percentages rounded to whole; Sources: \*US Census (2020), \*\*Statista (O'Neill 2023), Gallup (Jones 2022)

## Normality Checks for Dependent Variables

Table 8: results from Shapiro Wilk test and Skewness and Kurtosis Test

<i>Variable</i>	<i>W</i>	<i>V</i>	<i>z</i>	<i>Prob&gt;z</i>	<i>Pr(skewness)</i>	<i>Pr(kurtosis)</i>	<i>chi2(2)</i>	<i>Prob&gt;chi2</i>
<b><i>Policy Acceptability (n=671)</i></b>								
<i>Building infrastructure</i>	0.96	18.31	7.08	0	0	0	103.58	0
<i>Spending Tax</i>	0.98	9.17	5.40	0	0	0.33	52.48	0
<i>Implementing road toll</i>	1.00	1.12	0.27	0.40	0.44	0	110.44	0
<b><i>Policy Prioritization (n=671)</i></b>								
<i>Paving roads</i>	1.00	1.80	1.43	0.08	0	0	27.12	0
<i>Road maintenance</i>	1.00	0.90	-0.25	0.60	0.04	0	17.49	0

Source: Qualtrics Survey April 2023