

AN ABSTRACT OF THE DISSERTATION OF

Chelsea Batavia for the degree of Doctor of Philosophy in Forest Ecosystems and Society
presented on March 4, 2019

Title: On Morality, Psychology, and Conservation: An Interdisciplinary Appraisal of Ethics in Context

Abstract approved: _____

Michael Paul Nelson

Conservation is, among other things, the expression of a relationship between humans and nonhuman nature. This relationship can be described empirically using the methods of social science, but it can also be prescribed in the form of philosophical arguments. Scholars in the field of environmental ethics have discussed and debated how we should relate with nonhuman nature, formulating different accounts of an “environmental ethic.” While these accounts are highly variegated, many of them suggest humans have at least some direct moral obligations to at least some part(s) of nonhuman nature. Scholarship in environmental ethics is generally offered up with the presumption that, if people accepted and affirmed the tenets of an environmental ethic, they would then engage in more environmentally sustainable conduct. In this way, a clear link is presumed between ethical commitments and manifest behaviors. Recently, many in the conservation community have made a similar presumption, but in a radically different form. Proponents of “new conservation” or “ecosystem services” assume that 1) people are largely anthropocentric (i.e., ethically “human-centered”), and therefore 2) appealing to the human benefits of nonhuman nature will most effectively elicit support for conservation. This line of reasoning presupposes that support for conservation (a form of human behavior) is directly motivated by people’s ethical commitments. Each in their own ways, environmental ethicists and new conservationists/ecosystem services

enthusiasts attribute a strong behavioral influence to morality, largely disregarding the complex tapestry of social, situational, and psychological factors that also shape human behavior. The overarching objective of this work is to appraise how this larger context affects not only the expression but also the content of our ethical commitments, specifically as they pertain to the human relationship with nonhuman nature. Chapter One tests the new conservationist claim directly. The chapter reports findings from an online survey investigating how the type of beneficiary (human, nonhuman, or both) depicted in conservation outreach messages affects two metrics of support for conservation: attitudes toward the message and donations for a conservation organization. Results suggest messages highlighting only humans as conservation beneficiaries may not most effectively generate social support for conservation, but that social and situational variables other than the value basis of persuasive appeals may also influence their effectiveness. Chapter Two assesses the ethic-behavior linkage more generally, drawing on psychological research to question whether or under what conditions an environmental ethic might engender pro-environmental behavior. The discussion in this chapter suggests that an ethic, and the influence it exerts over behavior, is likely to be strongly limited by psychological, social, and structural factors. Chapters One and Two situate ethical commitments alongside a host of other variables that may influence individual human behavior. Chapter Three, finally, situates (philosophical) ethical reasoning alongside other variables that may influence the content of ethical commitments themselves. The chapter analyzes additional data from the survey featured in Chapter One to empirically investigate an influential line of normative theory in environmental ethics, called “extensionism,” which is predicated on the philosophical imperative of rational consistency. Results challenge extensionist theory as a descriptive explanation for survey respondents’ beliefs about value in nonhuman nature, suggesting such beliefs arise less by the pure exercise of rational deliberation prescribed by philosophers, than by a confluence of psychological processes. Altogether, this dissertation presents morality as a highly constrained, social and psychological phenomenon of human life. But this work also maintains that environmental ethics is an important aspirational endeavor, the value

of which supersedes any significance it has (or lacks) as a descriptive account of human conduct.

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On Morality, Psychology, and Conservation:
An Interdisciplinary Appraisal of Ethics in Context

by
Chelsea Batavia

A DISSERTATION

submitted to

Oregon State University

in partial fulfillment of
the requirements for the
degree of

Doctor of Philosophy

Presented March 4, 2019
Commencement June 2019

Doctor of Philosophy dissertation of Chelsea Batavia presented on March 4, 2019

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I understand that my dissertation will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my dissertation to any reader upon request.

Chelsea Batavia, Author

ACKNOWLEDGEMENTS

This work was funded by a National Science Foundation Doctoral Dissertation Research Improvement Grant [Award #1725530, 2017] and the National Science Foundation Long-Term Ecological Research Program at the H.J. Andrews Experimental Forest [DEB 1440409]. Additional support was provided by the Achievement Rewards for College Scientists (ARCS) Foundation and the Oregon State University College of Forestry.

I am indebted to a great number of people who have provided intellectual guidance of all sorts over the past six years. To Troy Hall and Mark Needham, I thank you for sharing your time and expertise on survey design and data analysis. Thanks to Ariel Muldoon for providing statistical advice with unwavering patience. I am grateful to Melora Park and Brett Morrisette for their assistance with the grant application and award process. I also thank Aaron McCright and Thomas Dietz for their helpful suggestions on conducting donation studies.

Deepest thanks to the H.J. Andrews Long-Term Ecological Research program for providing stable funding and a sense of community. Special thanks to Lina DiGregorio for helping me navigate the logistics of grant management and graduate school funding; to Cheryl Friesen for sharing my work and providing management insights; to Suzanne Remillard and Don Henshaw for data management assistance and emotional support; and to Fred Swanson, for many thought-provoking conversations.

I also wish to express my appreciation for the ARCS Foundation Portland Chapter, especially Jamie and Mike Anderson and Shelley and Joe Voboril. Your support was an unforeseen blessing, and I hope one day to pay your kindness and generosity forward.

To Jessica Bagley, no “thanks” is thanks enough for everything you do. We would all be lost without you.

I have received incredible mental and emotional support from so many people throughout my program. My particular thanks (in no particular order) to Jesse

Engebretson, Sonia Bruck, Katie Wollstein, Anna Talucci, Sativa Cruz, Sarah Kelly, Jasmine Brown, Lucia Cook Hadella, Karla Jarecke, Satish Serchan, Deanne Carlson, Logan Berner, Tyson Bertone-Riggs, Lissy Goralnik, and Leslie Ryan. I am grateful to each of you for coffee chats, dinner dates, walks, and/or conversations, big and small. Thanks to Professor Ruf, a brilliantly unconventional teacher who first pushed my mind outside the box; and Professor DelDonna, a true mentor who steadied me as I fumbled my way through my undergraduate and graduate studies. Special thanks to Daryaneh Badaly, for her enduring friendship and impromptu insights on all things psychology; to Aaron Webster, for his dancing and for believing in me; to Andre and Jay Webster, for keeping me humble; to my parents, for loving me and listening to me rant; and to Maestro, for letting me love him.

Last but certainly not least, I thank the members of my academic committee: Jeremy Bruskotter, for your good humor and invaluable research guidance; John Vucetich, for challenging me to think and write with precision; Julia Jones, for your thoughtful feedback and practical wisdom; and Hannah Gosnell, for sharing life advice and encouraging me to maintain a healthy sense of perspective.

Finally, thanks to my major advisor, Michael Paul Nelson, for teaching me how to use a paint roller.

CONTRIBUTION OF AUTHORS

Michael Paul Nelson (co-author on Chapters One, Two, and Three) provided overarching guidance for this dissertation, informing the research questions, methods, presentation of findings, and conclusions drawn. He supervised the empirical components of the work, including survey development and administration, and contributed to the preparation and revision of all three manuscripts.

Jeremy T. Bruskotter (co-author on Chapters One, Two, and Three) oversaw survey development and provided input into analysis and reporting of empirical results. He provided direction for the psychology components of this work, and contributed to the preparation and revision of all three manuscripts.

Julia A. Jones (co-author on Chapters One and Three) provided instruction and advice on the analysis of survey data and the reporting of empirical results. She contributed to the preparation and revision of the first and last manuscript.

John A. Vucetich (co-author on Chapter One) was involved in survey development, and particularly creation and refinement of the scale of moral inclusivity. He contributed to the preparation and revision of the first manuscript, and also provided substantive feedback that informed the content and organization of the third manuscript.

Hannah Gosnell (co-author on Chapter One) contributed to the preparation and revision of the first manuscript. She also assisted with the overall research design of this dissertation.

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DEDICATION

To Dr. Nelson.
For everything.

GENERAL INTRODUCTION

Background

Questions of morality have fascinated humans for centuries, even millennia. In literature, poetry, and other forms of creative expression, cultures across time and space have probed notions of value, justice, rights, duty, and welfare. But matters of morality are most formally queried by scholars of moral philosophy, or ethics. Employing systematic methods of rational analysis and argumentation, ethicists seek to understand the grounds, implications, and demands of morality; and ultimately to defend coherent, practicable theories of appropriate human conduct (Des Jardins, 2001). Normative (i.e., prescriptive or action-guiding) theory is conventionally situated within one of three major schools of thought: consequentialism, deontology, and virtue ethics. Consequentialist theories suggest a right or appropriate action is one that brings about the best outcomes, or consequences (Sinnott-Armstrong, 2015); deontological theories suggest right action upholds acknowledged moral principles, such as duties or rights (Alexander and Moore, 2016); and virtue theory suggests right actions are those manifest by good (i.e., virtuous) character (Hursthouse and Pettigrove, 2018).

Throughout modern history, Western moral philosophy has been concerned predominantly with human conduct toward other human beings, disregarding or overlooking any moral obligations humans may have directly to the nonhuman environment (Hargrove, 1989). Not until the latter half of the 20th century did this narrow focus begin to broaden, when scholars in the then-nascent field of environmental ethics realized human conduct toward nonhuman nature also falls within the purview of ethical inquiry. Distinguished from applied ethics, which uses traditional ethical theories to address practical issues in specific contexts (e.g., healthcare, engineering, or education), environmental ethicists undertook a more radical re-imagining of moral responsibility (Des Jardins, 2001).

Humans have intention, will, and extraordinary capacities for complex reasoning. We also have the ability to form notions of right and wrong, and we can articulate and justify the grounds for our actions; indeed, the basic premise of ethics is that we ought to act in ways that can be so justified. For these reasons, (most) humans are considered

moral *agents*, i.e., we have and choose to act upon notions of right and wrong, and we hold ourselves accountable for our actions and inactions (Eshleman, 2016). However, if human beings are unique in the capacity to act as moral agents, they are not necessarily unique in their ability to be acted upon as moral *patients*. Moral patients are entities who fall within the scope of human morality; put differently, they have direct moral standing within the moral community (see Nelson, 2009; Goralnik and Nelson, 2012). Often the direct moral standing of moral patients is grounded in their intrinsic value, i.e., the value they have for their own sake, beyond any benefits they may provide others (Vucetich et al., 2015; Batavia and Nelson, 2017). The literature in environmental ethics is replete with discourse and debate over the moral patiency and/or intrinsic value of different types of entities, including nonhuman animals (e.g., Regan, 1983; Singer, 2011); living organisms other than animals, such as plants (e.g., Taylor, 1981; Agar, 2001; Marder, 2013); ecological collectives, such as species and ecosystems (e.g., Callicott, 1989; Johnson, 1992; Smith, 2016); or even Earth overall, as an interconnected biotic system (e.g., Naess, 2011; Lovelock, 2000). Scholars also seek to understand what obligations humans might have regarding these various entities, e.g., to respect them, consider their interests, care for them, and/or protect their wellbeing (Goodpaster, 1978; Taylor, 1981; Plumwood, 1993; Rolston, 2012).

“Conservation,” as used here and in chapters below, is an effort to protect the persistence and diversity of life on Earth at all levels of organization (United Nations, 1992). This mission rests upon both scientific and ethical postulates (Soulé, 1985), the latter clearly overlapping with questions of interest to environmental ethicists. And yet, though environmental ethics is well established as a scholarly field, its integration with the science and praxis of conservation remains limited. If in principle it is generally accepted that conservation has both scientific and ethical dimensions (Soulé, 1985), in practice the latter receive less concerted attention than the former (Vucetich and Nelson, 2013; Saltz et al., 2018). But perhaps the balance is shifting. Anecdotally, there appears to be increasing interest in the ethical dimensions of conservation, or “conservation ethics,” evidenced by a growing scholarly literature that uses concepts or frameworks from environmental ethics to address moral issues in conservation (e.g., Minter and

Collins, 2005; Vucetich and Nelson, 2007; Maguire and Justus, 2009; Nelson et al., 2016; Mathews, 2016; Batavia and Nelson, 2018a,b; Wallach et al., 2018).¹

As scholarship on conservation ethics slowly carves out a niche in the conservation community, the conservation science landscape is also diversifying. Along with ongoing research in established fields such as conservation biology (Soulé, 1985) and landscape ecology (Turner, 1989), a growing, interdisciplinary scientific literature focuses on the social or human dimensions of conservation as well (Osbaldiston, 2013; Bennett et al., 2016). This includes a robust body of research on environmental values and beliefs (i.e., values and beliefs pertaining to “nature,” or various elements thereof). Some of this work echoes themes discussed in the environmental ethics literature. Manfredo and colleagues, for example, have documented a shift in “wildlife value orientations,” away from a utilitarian, domineering view of wildlife and toward a more egalitarian and mutualistic view (Manfredo et al., 2009; Teel and Manfredo, 2009; Manfredo et al., 2016). Researchers in the Netherlands have characterized different “visions of nature,” describing how people understand themselves in relation to the rest of nonhuman nature; and how these visions are associated with ideas about appropriate human-nature relationships (Van den Born et al., 2001; Buijs et al., 2009; De Groot et al., 2011). In a more deliberate synthesis with environmental ethics, Vucetich et al. (2015) reported evidence that intrinsic value may be widely ascribed to wildlife among US publics (also Lute et al., 2016; Lute and Attari, 2017).

In general, the research reported above suggests people in the Western world do not regard humans as sole bearers of intrinsic value, free to utilize and control nonhuman nature only according to their wont. Instead, it seems people endorse subtler notions of a human-nature relationship that cannot be captured in purely instrumental terms. But even as research reveals more about the complex, pluralistic, and often morally rich ways humans view and value nonhuman nature, the overarching moral and conceptual paradigm for conservation has moved in a different direction, as nonhuman nature has increasingly been understood in utilitarian and often economic terms. Although economic

¹ Technically “conservation ethics” refers to formal methods of argumentation and argument analysis (Nelson and Vucetich, 2012), but here I use the term loosely to refer to any work that systematically and/or deliberately addresses ethical issues in conservation.

metaphors for nature have a long history (Gómez-Baggethun et al., 2010), they have reached perhaps unprecedented levels of influence with the ascendancy of the “ecosystem services” framework for conservation (Abson et al., 2014). Within this framework, nonhuman nature is viewed, valued, and protected as a source of goods and benefits (i.e., “services”), which both support and enhance the quality of human life (Millennium Ecosystem Assessment, 2005).

In theory, valuing the services nonhuman nature provides humans is fully compatible with the recognition of nonhuman nature’s intrinsic value (Callicott, 1989; Vucetich et al., 2015). Indeed, the Millennium Ecosystem Assessment (2005), one of the formative documents catalyzing the adoption of the ecosystem services framework, explicitly identifies and affirms the intrinsic value of nonhuman nature. And yet, although intrinsic value is widely accepted as a normative underpinning for conservation, codified in the organizational values and overarching tenets of the conservation community (United Nations, 1992; Society for Conservation Biology, 2018), its practical significance has remained elusive. Within an ecosystem services framework, it remains unclear how or whether the intrinsic value of nonhuman nature will or indeed could exert influence over practical decision-making. Many critics have argued against the ecosystem services framework on grounds that it perpetuates or encourages instrumental, anthropocentric views of nonhuman nature, which some suggest may even counteract the long-term goals of conservation and sustainability (McCauley, 2006; Soulé, 2013; Silvertown, 2015; Batavia and Nelson, 2017; see also Schröter et al., 2014).

Still, if some in the conservation community have vehemently contested the ecosystem services framework, many others have enthusiastically embraced it (Abson et al., 2014). Proponents often point to the various advantages it affords by way of decision support, e.g., by allowing comprehensive cost-benefit accounting and supporting tradeoff analysis (Weesie and van Andel, 2008; Daily et al., 2009; Luck et al., 2012; Costanza et al., 2017). However, the appeal of the ecosystem services framework also partially reflects an assumption that conservationists will receive broader support for their work, and among more diverse publics, if they emphasize the benefits nonhuman nature provides for humans (Armsworth et al., 2007; Marvier and Wong, 2012; Marvier and

Kareiva, 2014; Scharks and Masuda, 2016; Gunton et al., 2017). This claim, which was conspicuously advanced in the discourse around so-called “new conservation,” can be articulated formally as follows:

- P1. When we [conservationists] emphasize [in word and action] the human benefits of nature, we speak to the [anthropocentric utilitarian] values and beliefs of broader segments of the public.
- P2. Speaking to the values and beliefs of broader segments of the public effectively builds support for conservation.
- C1. Therefore, emphasizing the human benefits of nature effectively builds support for conservation.
- P3. We should effectively build support for conservation.
- C2. Therefore, we should emphasize the human benefits of nature.

From an ethical perspective it is not clear that the normative premise P3 is entirely appropriate; at least not without qualification. This, in fact, was the starting point for my dissertation (Batavia and Nelson, 2016, 2017). But the argument also raises interesting and important empirical questions about the accuracy of its descriptive premises. Work cited above challenges at least part of P1 by suggesting the public does not primarily view or value nature only as a repository of benefits and resources for humans, and on this ground alone the soundness of the conclusion is compromised. But the claim advanced in P2 also warrants critical attention.

At an immediate level, P2 is a claim about communication, proposing that if conservationists represent themselves or their work as a reflection of people’s values and beliefs, those people can readily be persuaded to support conservation. Such “value-matching” messages can indeed be highly persuasive (Feinberg and Willer, 2013; Kidwell et al., 2013; Wolsko, 2017), but like any persuasive effort, their effectiveness may be sensitive to contextual factors as well. The mood of the message recipient, the perceived credibility or trustworthiness of the message source, nonverbal cues, and various structural or substantive aspects of the message itself (e.g., framing, emotionality, or humor), among other things, may also influence how a message is processed and received (Petty and Cacioppo, 1986; Bless et al., 1990; Maheswaran and Meyers-Levy,

1990; Nelson and Garst, 2005; Cesario and Higgins, 2008; Eisend, 2011). Thus, as an empirical claim about persuasive communication, the truth of P2 is at best conditional.

More generally, though, P2 presupposes that value-matching appeals work because people tend to behave in ways that are consistent with their (moral) values and beliefs. In other words, the premise presupposes that humans act on their ethics. It seems altogether sensible that people would protect what they value and order their behaviors according to their beliefs; and indeed, research often demonstrates a relationship between various measures of environmental values or beliefs and behaviors, or at least behavioral intentions (Schultz and Zelezny, 1998; Stern et al., 1999; Manfredo et al., 2009; van Riper and Kyle, 2014; Steg, 2016). But human behavior is also influenced by much more than our notions of value in nonhuman nature, or our reasoned beliefs about how we ought to interact with it.

For example, values exert greater or lesser degrees of influence based on the level of priority afforded to them by the individual (Schwartz, 1994). Even high priority values must be activated in context to inform behavior as well (Steg, 2016). Activating values or other cognitions, such as personal moral norms (Stern et al., 1999), is just one of many ways context affects human behavior. Situational factors, social influences, and economic or political institutions may discourage or inhibit us from acting on our ethical commitments (e.g., Corraliza and Berenguer, 2000; Thøgersen, 2005; Griskevicius et al., 2010; Abrahamse and Steg, 2013). Affective (i.e., emotional) processes also comprise part of the context within which ethical beliefs form and (perhaps) influence behavior. Indeed, recent work in moral psychology suggests moral judgment overall is better understood as a fundamentally intuitive and affective response, which is then justified after the fact as a reasoned belief (Haidt, 2012). Research suggests these sorts of affective judgments may be particularly important when humans grant or deny moral standing to nonhuman beings (Bastian et al., 2012b; Piazza and Loughnan, 2016; Niemyjska et al., 2016). In short, humans are complex critters, and it is not clear that P2 above adequately accounts for the intricacies of our behavior.

The task of conservation ethics is to understand how we ought to act as stewards and beneficiaries of Earth's biodiversity and ecological systems. This is essential work,

articulating a positive aspiration for the persistence of life on Earth and a sustainable, mutually affirming relationship between humans and the rest of the biota and abiotic environment. But while we may subscribe to certain notions of value or systems of normative belief - and even justify them using sophisticated philosophical arguments - evidently a much larger suite of factors influences human behavior, beyond what we think we ought to do in any instance. The overarching objective of this dissertation is to understand environmental ethics not just as a philosophical endeavor but also as an empirical phenomenon, which is unavoidably contextualized by various aspects of human psychology and social life.

Organization and objectives²

Chapter One, co-authored by Jeremy T. Bruskotter, John A. Vucetich, Julia A. Jones, Hannah Gosnell, and Michael Paul Nelson, and published in the journal *Biological Conservation* (Batavia et al., 2018a), is most directly tied to the discourse around ecosystem services and new conservation. The chapter focuses on one particular form of pro-environmental behavior, *viz.*, charitable giving to a conservation organization. The overall objective is to empirically test key elements of P1 and P2 in the argument above, by questioning whether messages that emphasize human benefits of nature most effectively attract financial support for conservation. Using an experimental design, we test the effectiveness of seven conservation outreach messages, which vary according to which types of moral patients (human, nonhuman, or both) they depict. Data was collected via online survey, which was administered to a non-representative sample of Americans using panel services provided by Qualtrics, LLC (N = 1141), funded by a National Science Foundation Doctoral Dissertation Improvement Grant (Award #1725530, 2017). To look for a value-matching effect, we also took a measure of respondents' ethical values and beliefs using a new scale of "moral inclusivity," which measures the scope of one's moral community and the types of moral patients it includes. We use a subset of the items in this scale to empirically cluster the sample into "less," "somewhat," and "highly" inclusive respondents. Results reported in Chapter One

² Chapters One and Two have both been lightly edited for presentation in this dissertation.

suggest outreach messages depicting only humans as conservation beneficiaries do not more effectively generate monetary support for conservation than messages depicting nonhumans as conservation beneficiaries, even among the least inclusive respondents. We discuss implications for the conservation discourse around intrinsic value and ecosystem services, as well as situational and psychological factors that may influence the effects (and effectiveness) of value-based appeals.

Chapter Two is a more general discussion of the relationship between an environmental ethic and human behavior. Co-authored by Jeremy T. Bruskotter and Michael Paul Nelson, and currently in press at the journal *Environmental Values* (Batavia et al., 2019), the chapter is a synthesis of literature in environmental ethics with research on social and environmental psychology. As a philosophical discipline environmental ethics has a largely theoretical agenda, but scholars in the field also operate with the prevailing assumption that, if they develop and people subsequently adopt an environmental ethic, human behavior will undergo a meaningful shift in the direction of sustainability. The objective of this chapter is to consider whether, in what ways, and/or under what conditions an environmental ethic is likely to so influence human behavior. The chapter focuses on three prominent threads of scholarship in environmental ethics, on 1) the intrinsic value of nonhuman nature 2) an ecofeminist ethic of care; and 3) Aldo Leopold's land ethic, citing psychological research that demonstrates how each may (or may not) underwrite pro-environmental behavior. We conclude that an environmental ethic has the potential to influence behavior to some extent and under some circumstances, but overall environmental ethics are conditioned and constrained in important ways by the larger socio-cultural context.

Additional exploratory analyses of the moral inclusivity scale featured in Chapter One gave rise to new research questions, which are explored in Chapter Three. The overall objective of this chapter, co-authored by Jeremy T. Bruskotter, Michael Paul Nelson, and Julia A. Jones, and currently in preparation for the journal *Biodiversity and Conservation*, is to investigate how environmental ethicists' prescriptive theories of moral inclusivity relate to moral inclusivity as a descriptive phenomenon. Specifically, we assess whether people's professed ethical beliefs can be described using an influential

strand of prescriptive theory in environmental ethics, called “extensionism.” According to extensionist logic, the moral community should include all bearers of intrinsic value, which we can recognize because they meet certain morally relevant criteria. Extensionists have identified four different criteria of intrinsic value: humanness (which engenders an anthropocentric worldview); sentience/subjective experience (which engenders a zoocentric worldview); life (which engenders a biocentric worldview); or vital interests (which engender an ecocentric worldview). We quantify the extent to which study participants can be affiliated with one of these four worldviews, as characterized by the inclusion of abstract sets of entities circumscribed by extensionist criteria. We then assess the extent to which these respondents demonstrate “internal consistency” by including all and only the specific entities that meet the extensionist criteria associated with their respective worldviews (asking, e.g., if a respondent affiliated with zoocentrism because she included “people” and “animals” then included a family member and a fly, but not an oak tree or an agricultural ecosystem). Our results suggest extensionist logic does not explain which specific entities respondents included (or not) in their moral communities, challenging extensionist theory as an adequate descriptive (but not necessarily prescriptive) account of value in nonhuman nature. We draw on several threads of psychological research to interpret results, and discuss practical implications for biodiversity conservation.

Limitations

Each chapter highlights study-specific limitations, but three key limitations of the empirical methods used in Chapters One and Three merit repetition here. First, the sample was drawn from an online panel of the American public, supplied by the corporate entity Qualtrics, LLC. Panel services are increasingly used in social scientific research because they improve the convenience and efficiency of data collection, as compared with traditional in-person methods of survey-based research (Duffy et al., 2005). However, online panels also have limitations. For instance, online panelists may be more likely to answer survey questions quickly and without reflection, yielding low-quality data (Yeager et al., 2011; Smith et al., 2016). We employed several procedures to

counteract these potential data quality issues. Respondents who did not fully complete the survey, or who failed any of four attention check items embedded throughout the survey, were excluded from the final dataset. In addition, after data collection was complete I compared each respondent's total response time to the median, and then scrutinized the data from individual respondents who completed the survey in significantly shorter amounts of time than the rest of the sample. I found no obvious data quality issues (e.g., straight-lining or erratic responses). In addition, because panels are comprised of self-selected respondents, all of whom have readily available internet access, as well as time and motivation to participate in survey research for compensation, panel-based samples are not necessarily representative of any larger population (Duffy et al., 2005; Hays et al., 2015). As such, results reported in Chapters One and Three (particularly sample proportions and estimated means) cannot be generalized to the overall US public.

Second, the scale of moral inclusivity was developed for operational purposes, *viz.*, to test for the possible moderating effect of ethical values and beliefs on the experimental message manipulation employed in Chapter One. Although internal reliability of various subsets of the scale was generally acceptable (with exceptions noted in Chapters One and Three), full assessment and refinement of the scale's psychometric properties are warranted. I also recommend a mixed-methods approach pairing replicate studies with interviews or focus groups to better understand how people interpret scale items and how their responses are influenced by these interpretations.

Third, the survey was designed to test and quantify relationships between variables. It was not designed to determine what underlying mechanisms or processes explain these relationships. As such, the accounts provided in the discussion sections of Chapters One and Three are offered as testable hypotheses; plausible and informed interpretations of the data, but certainly not definitive explanations of observed results.

A final word of preamble

As moral agents, humans have both the will and ability to engage in rational deliberation in pursuit of the good and the right. This implies we have a notion (or notions) of the good and the right, and it is the work of ethics to articulate and defend

such notions. Exercising our capacities for morality is an essential part of what it means to be human. In this sense, it is a basic axiom of this dissertation that ethics matter. The chapters below represent an effort to understand the extent to which ethics matter in a different sense, *viz.*, that they have some tangible presence or exert some measurable influence in the world, particularly in the realm of conservation. Findings that challenge the significance of ethics in this latter (descriptive and behavioral) sense do not necessarily diminish the significance of ethics in the former (normative and humanistic) sense.

CHAPTER ONE
NATURE FOR WHOM? HOW TYPE OF BENEFICIARY INFLUENCES THE
EFFECTIVENESS OF CONSERVATION OUTREACH MESSAGES

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Introduction

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

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

Most research, including the work cited above, verbally and/or visually manipulated the representation (e.g., identity or number) of either all human or all nonhuman beneficiaries. However, the beneficiaries of conservation potentially include

both humans *and* nonhumans, necessitating a basic choice about which type(s) of entities (human, nonhuman, or both) to emphasize in outreach messages. In recent years, many in the scholarly conservation community have chosen to emphasize the human beneficiaries of conservation, highlighting the instrumental values, or “ecosystem services,” humans receive from ecosystems and biodiversity (Abson et al., 2014). This shift is precipitated, in part, by the perceived need to conceptualize and quantify the value of nonhuman nature in a form that will be influential in practical policy and management contexts (e.g., Luck et al., 2012; Fisher and Brown, 2014). But the ascendancy of the ecosystem services framework has also, at least in part, been motivated by recognition that conservation efforts require social support to succeed (Kendal and Ford, 2018). This realization, paired with a common assumption that, “protecting biodiversity or nature for its intrinsic value...[is] inspiring for relatively narrow segments of the population” (Marvier, 2014, p. 2; also, e.g., Luck et al., 2012; Marvier and Kareiva, 2014), has galvanized many conservationists to find and emphasize other (e.g., instrumental) reasons for conservation, which will “inspire” broader segments of the public to support their work. Though widely embraced, the “nature for humans” approach (Mace, 2014) has also been controversial, generating extensive debate about the goals, methods, and very meaning of conservation (e.g., Soulé, 2013; Tallis and Lubchenco, 2014; Sandbrook, 2015; Pearson, 2016). However, scant research has explicitly examined the effectiveness of “nature for humans” as a messaging strategy, or tested it against “nature for nature’s sake” (Doak et al., 2013; Bekessy et al., 2018).

In line with this objective, Marvier and Wong (2012) presented a sample of the American public with two statements, one suggesting the “best reason” for conservation is for “the benefits people can derive,” and the other suggesting the best reason to protect nonhuman nature is “for its own sake.” They found a small majority of the general sample favored the first reason, although the majority was more pronounced among political conservatives and African Americans. On this basis, they concluded conservationists should highlight the human benefits of conservation in order to attract more diverse demographics of supporters. Although Marvier and Wong’s (2012) study shows human benefits represent an important motivation for conservation, they did not

associate ratings of agreement with any behavioral outcomes (e.g., membership with a conservation organization or intentions to donate). Therefore, we cannot conclude from their results that appeals to human conservation beneficiaries are more effective, in any practical sense, than appeals to nonhuman beneficiaries (i.e., nonhuman nature for its own sake).

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

Matching effects have been observed for different types of individual characteristics (e.g., Ryff and Wirth, 2016), but we are interested specifically in the effect of messages that match recipients' beliefs about value in the nonhuman world. Various theoretical traditions provide guidance on how values and environmentally-relevant beliefs affect people's perceptions of and relations with the nonhuman environment (e.g., Dietz et al., 2005; Manfredo et al., 2009). For the present research we adopt a framework informed by scholarship in environmental ethics. Whereas, in the psychological literature, values are described as stable goals or end states (Schwartz and Bilsky, 1987), philosophers define value as a property of its bearer that commands a favorable attitude (Zimmerman, 2001). Ethicists distinguish between instrumental value, i.e., the value of an entity for some other entity, and intrinsic value, i.e., the value of an entity (or its interests) for its own sake, beyond and in addition to any purposes it may serve for other ends (Vucetich et al., 2015). Environmental ethicists have theorized that the types of entities ascribed with intrinsic value define the scope of a person's "moral community," which refers to the set of entities valued intrinsically, i.e., not just as means, but also as ends in themselves (Goralnik and Nelson, 2012). Environmental ethicists have posited four main ways the moral community might be defined. Anthropocentrism includes only humans in the moral community; zoocentrism includes humans and individual nonhuman animals; biocentrism includes all individual living beings; and ecocentrism includes all individual living beings and ecological collectives, such as species and ecosystems (Goralnik and Nelson, 2012). In the current research we refer to the breadth of an individual's moral community as "moral inclusivity." Individuals with larger, more diversified moral communities are considered more inclusive, and individuals with smaller, more homogeneous moral communities are considered less inclusive.

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

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

For less inclusive individuals we predicted:

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

For more inclusive individuals we formulated two alternative hypotheses:

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

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

Materials and methods

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

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

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

Survey part one: information about respondents.

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

For the present analysis we used 13 items to measure respondents' moral inclusivity. These items were designed to capture variability in the extent to which different types of entities (humans, individual nonhuman animals, individual living beings, and ecological collectives) are included in the respondent's moral community (see Table 1.1). We used plants as a case of individual living beings, so as to clearly differentiate beliefs about individual animals from beliefs about individual non-animal

living beings, and we used species and ecosystems as examples of ecological collectives. The items employed a Likert response format ranging from 1 to 7 (strongly disagree to strongly agree). Higher numbers correspond to more inclusive views of the entity in question.

Survey part two: outreach message manipulation

In the second part of the survey, respondents were shown a flyer promoting the cause of conservation. Verbal messages communicated in the flyers systematically manipulated two factors, the first being the type of conservation beneficiary represented in the message. We call this factor “beneficiary.” The second factor, called “moral foundation” (Graham et al., 2009), varied how conservation was framed as a moral issue, by either invoking 1) community ties, authority, and the sanctity of nature (“binding” foundations), or 2) avoidance of harm and fairness (“individualizing” foundations). Results of the second factor manipulation are not reported on here, but information is provided in Appendix B.

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

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

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

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

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

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

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

Each respondent was randomly assigned to view only one of the seven messages. We used this “between-subjects” design (as opposed to a “within-subject” design, in which every respondent would have viewed all seven messages) for two reasons. First, we sought to reduce response burden by minimizing the number of messages each person was asked to read. Second, we hoped to more closely approximate a realistic outreach scenario, in which an individual would receive and respond to only one message (e.g., a mailing or internet ad). We used a visual image (a color-enhanced photo of the Earth) that would have face validity as a backdrop for a conservation outreach flyer, but would neither confound nor distract attention from the experimental manipulations presented in verbal messages. This image was held constant across treatments. Efforts were also made to keep other aspects of the verbal message (e.g., grammatical structure and length) relatively consistent. All seven messages are shown in Appendix A. Manipulation checks confirming the effectiveness of the beneficiary message manipulation are reported in Appendix B (Table B.1). Responses to the manipulation check items suggested the control was not perceived as a “no-beneficiary” message, and so did not serve as an adequate control for the beneficiary manipulation (see Appendix B for results and brief discussion). We therefore excluded the control from further analysis.

Survey part three: response variables

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

Donation was measured following a procedure validated by Clements et al. (2015). We gave each respondent five dollars in thanks for his or her participation, but also offered the opportunity to designate some proportion of the gift as a donation to a conservation organization. Before beginning the survey respondents were asked to provide informed consent, at which time they were told the research project was

investigating how and why people react positively or negatively to conservation outreach messages. Respondents were not explicitly informed their donations would be recorded as data, in efforts to render the decision context as naturalistic as possible. After entering whatever amount they wished to donate (\$0-\$5), on the next page respondents were informed that their donation amount had been recorded as data. Because this procedure entailed an element of deception, respondents were given the option to withdraw from the sample. Payments owed to each person were calculated following data collection and distributed by Qualtrics, LLC. The balance was donated in a lump sum to the Monterey Bay Aquarium.

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

Data analysis

Statistical data analysis was conducted in IBM SPSS (version 24). We used principal components analysis (PCA) to group the 13 moral inclusivity items for hypothesis testing. PCA is a multivariate statistical procedure used to reduce a set of measured variables to a smaller number of composites, which are computed as linear combinations of the original variables (Tabachnik and Fidell, 2013). Principal components are extracted by grouping items in n-dimensional space in the configuration that best accounts for observed variance between uncorrelated sets of similar item scores (Tabachnik and Fidell, 2013). Although closely related to factor analysis, PCA was deemed more appropriate for our objectives since our intent was not to test the latent variable structure of the moral inclusivity scale, *per se*, but rather to reduce the scale for operational purposes (Tabachnik and Fidell, 2013). We used PCA with varimax rotation, retaining only components with eigenvalues greater than one and suppressing coefficients below 0.4. Cronbach's alpha (α) was used to confirm internal consistency of the resulting components, and composite variables were computed by averaging each respondent's scores on the set of items loading on each component. The resulting composites ranged

from 1 to 7, with scores below three generally suggesting exclusion of the entities in question from the moral community; scores above five generally suggesting inclusion of the entities in question within the moral community; and a score of four suggesting ambivalence toward the entities in question as members of the moral community. These composite variables were then entered in a k-means cluster analysis. K-means clustering is used to classify respondents into a specified number of groups by assigning them to whichever cluster minimizes the distance between item scores and the cluster mean (Everitt, 2011). The resulting clusters were subsequently used in statistical analyses, described below, as a categorical measure of overall moral inclusivity (“inclusivity”).

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

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

sample). We also controlled for effects related to the second manipulated factor (moral foundation) and its two-way interaction with political orientation (see Appendix B).

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

Results

The survey was completed by 1600 individuals, but 17 percent ($n = 269$) chose to withdraw following the donation de-brief, reducing the sample size to $N = 1331$. Removing the control group brought the overall sample size to $N = 1141$. 372 respondents viewed HMN, 384 viewed NON, and 385 viewed COMB. Full descriptive information about the sample is in Appendix B, Table B.2.

Moral inclusivity

Three principal components explained a cumulative 61.57 percent of the variance in the 13 moral inclusivity items (Table 1.1). The first component was comprised of six items suggesting inclusion of ecological collectives in the moral community. Reliability on these items was good ($\alpha = 0.88$), so each respondent's six item scores were averaged into one composite measure, which we call "MI collective." The second component was comprised of four items suggesting inclusion of individual plants and animals in the moral community. These four items also had acceptable internal consistency ($\alpha = 0.78$), so each respondent's scores were averaged to create a second composite, which we call "MI individual." The third component included three items suggesting inclusion of human beings in the moral community. Initial analysis indicated a higher alpha could be achieved by excluding the second item, but the alpha level of the remaining two items ($\alpha = 0.51$) still fell below conventionally acceptable levels. An "adequate" alpha level is determined by the level of precision required in the application of the measure (Cortina, 1993). While ideally our scale items would have reliably characterized specific beliefs

and values associated with human beings as members of the moral community, we required only a coarse measure confirming the theoretically plausible and empirically supported (Crimston et al., 2016) assumption that humans are generally included in people's moral communities. As anticipated, reported agreement (i.e., scores of five or higher) was high for both items (87 and 97 percent of the sample, respectively). We therefore proceeded in spite of the low reliability score, noting that this section of the scale warrants further refinement in future research. We averaged each respondent's scores on the two items to form a third composite, which we call "MI human."

K-means cluster analysis specifying three categories returned groups that were interpretable within our theoretical framework (Figure 1.1). Cluster one converged around the lowest means for all three composites. However, whereas the cluster mean for MI human was on the inclusion side of the range, cluster means for MI individual and MI collective fell within the range of scores suggesting exclusion of, or at most ambivalence toward, nonhuman individuals and collectives. Cluster three converged around the highest means for all three composites, suggesting respondents in this cluster reported strong beliefs that humans, nonhuman individuals, and ecological collectives are all included in their moral community. Compared to clusters one and three, cluster two converged around intermediate means on all three composites, suggesting respondents in this cluster include humans, nonhuman individuals, and ecological collectives in their moral community, but are more tentative about nonhuman entities (and particularly nonhuman individuals) than respondents in cluster three. Based on these interpretations, clusters one, two, and three were labeled "less inclusive," "somewhat inclusive," and "broadly inclusive," respectively.

Attitudes

Cronbach's alpha was improved by removing the third attitude item, so we averaged each respondent's scores on only the first two items to create the composite attitude measure ($\alpha = 0.94$). Beneficiary was not a significant predictor of mean attitude scores, and we found no significant interaction between beneficiary and inclusivity (Appendix B, Table B.3). However, attitudes varied significantly between inclusivity

groups. Mean attitude scores were 6.72, 6.01, and 5.00 for broadly, somewhat, and less inclusive individuals, respectively (Table 1.2). All pairwise differences were statistically significant ($p < 0.001$).

Donation

Both inclusivity and beneficiary were significant predictors of decision to donate (Appendix B, Table B.4). Broadly and somewhat inclusive individuals were 4.35 and 3.98 times more likely to donate, respectively, than less inclusive individuals (Table 1.2). Individuals who viewed NON were 1.60 times more likely to donate than individuals who viewed HMN.

Both inclusivity and beneficiary also predicted donation amount (Table 1.2; additional information in Appendix B, Table B.5). On average, broadly inclusive individuals donated \$0.74 more than less inclusive individuals and \$0.52 more than somewhat inclusive individuals. Individuals who viewed NON and COMB donated \$0.56 and \$0.55 more, respectively, than individuals who viewed HMN, although the difference between HMN and COMB was only marginally significant ($p = 0.051$).

However, both main effects were qualified in the presence of a significant interaction between beneficiary and inclusivity. Donation amounts differed by beneficiary only among less inclusive individuals (Table 1.2). In this group, only mean donation amounts for HMN and NON were significantly different, with less inclusive individuals who viewed NON donating \$1.74 more, on average, than less inclusive individuals who viewed HMN. Donation amounts did not differ significantly by beneficiary type among somewhat or broadly inclusive individuals. Conversely, donation amounts differed significantly between inclusivity groups only for individuals who viewed HMN, with broadly inclusive individuals donating \$1.74 more than less inclusive individuals and \$0.67 more than somewhat inclusive individuals. Both differences were statistically significant. Inclusivity was a marginally significant predictor of donation amount overall among individuals who viewed COMB ($F_{2, 692} = 3.10$, $p = 0.046$, $\eta_p^2 = 0.009$), but only the pairwise difference between somewhat and broadly inclusive individuals remotely approached statistical significance ($p = 0.08$). Although the

conservative Bonferroni correction may have precluded detection of a significant effect, we report only suggestive evidence that donations for COMB differ between somewhat and broadly inclusive individuals. Donation amounts among individuals who viewed NON did not differ significantly between inclusivity groups.

Discussion

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

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

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

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

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

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

Against hypothesis H1 that human beneficiary messages would elicit the highest donations from less inclusive individuals, respondents in the less inclusive group actually donated less money to human beneficiary messages than either of the other two messages (although only the difference between human and nonhuman beneficiaries was statistically significant). These results suggest the effects of value-matching appeals in conservation outreach messages may be conditioned in important ways by contextual factors; in this case, the broader survey context. Although a message representing only human beneficiaries matched less inclusive individuals' operative notions of the moral community, throughout the survey these individuals may have formed opinions about our (the researchers') values and beliefs based on our formulation of the moral inclusivity questions. The flyers were presented immediately following a series of questions asking, e.g., if fungi have intrinsic value, clearly indicating that we entertain such notions as valid propositions. Against this perhaps striking and, for less inclusive individuals, provocative backdrop, the values communicated in the human message may have seemed discrepant

or even contrived, raising suspicion about alternative motivations or manipulative intentions behind the message (Petty and Cacioppo, 1979). For many people, this awareness may have deterred donation in the first place. For others, heightened awareness of persuasive efforts may have merely attenuated the response. Liu et al. (2016) report that when an argument is compatible with pre-held beliefs, but judged to be weak, individuals tend to deliberate more and form less extreme attitudes toward the argument. In a similar way, less inclusive individuals, who (like most of the sample) were generally amenable to conservation, perhaps supported and found resonance in the human beneficiary message, yet questioned its genuineness in the context of the survey. This ambivalence may have manifested as a decision to donate, but a lesser amount.

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

Finally, and also against hypothesis H1, the nonhuman and combined messages did not elicit lower donations from less inclusive individuals than from either somewhat or broadly inclusive individuals. Here we suspect the effect of value mismatch was predominantly reflected in the more basic decision not to donate by less inclusive individuals (who were least likely to donate overall, regardless of beneficiary type). The donation choices of less inclusive individuals who did donate might be explained by processes cited above, e.g., the relatively high processing fluency facilitated by a nonhuman beneficiary message in the context of this survey or in association with “conservation.” But we also cannot rule out that less inclusive individuals who donated after viewing nonhuman or combined messages considered the instrumental values of the nonhuman entities mentioned in the flyer, in spite of our efforts to present those entities

in a light suggesting intrinsic value. People are active participants in, rather than passive consumers of, persuasive communications (Petty and Cacioppo, 1986). As such, it is plausible that less inclusive individuals interpreted the message to align with their own values and beliefs, and donated accordingly.

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

In addition, the nature of our sample limits the scope of inferences that can be drawn from our results. Online panels provide convenience and allow for larger samples than are otherwise achievable, but respondents are self-selected and do not necessarily represent views of the broader public. Although we had a roughly balanced representation of various metrics of demographic diversity, self-identified Caucasians constituted nearly 84% of the sample. Discourse in conservation has increasingly highlighted the importance of understanding and incorporating diverse perspectives (Gould et al., 2018). Future studies should therefore replicate this study with a more representative sampling of diverse social groups both within and outside the US,

Conclusions

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

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

with an anthropocentric perspective, and may create or perpetuate the false impression that anthropocentrism prevails in society at large. Promoting the protection of nonhuman entities as bearers of intrinsic value and proper objects of moral concern may be an effective way for conservationists to build social support, while also nurturing and normalizing non-anthropocentric values and beliefs.

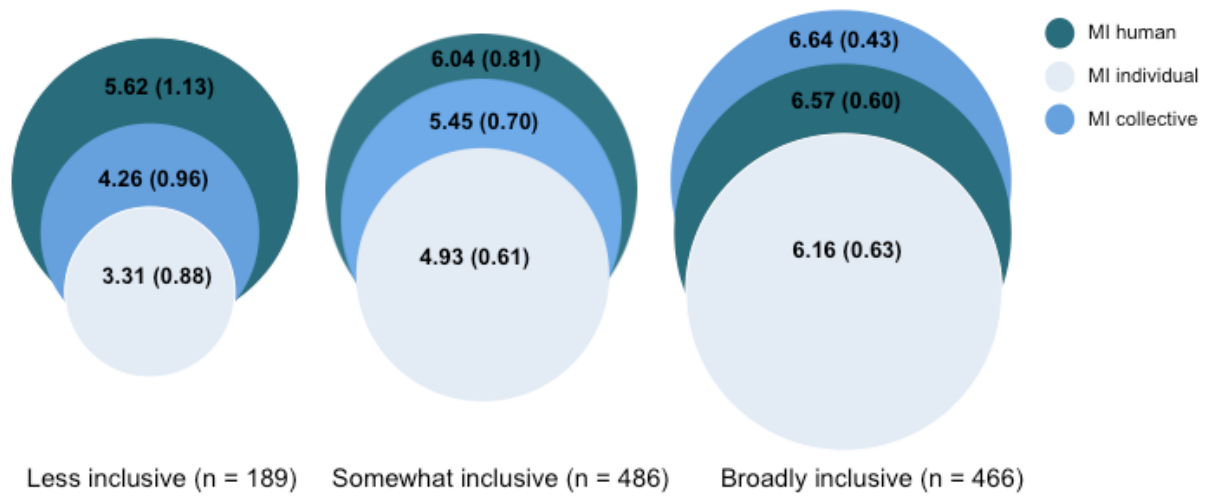


Figure 1.1 Characterization of clusters resulting from k-means cluster analysis of three moral inclusivity (MI) composite variables (MI human, MI individual, and MI collective). Cluster means (with standard deviations) are reported for each of the composite variables. Circle sizes are scaled to composite means.

Table 1.1 Principal components resulting from principal components analysis with orthogonal rotation on 13 moral inclusivity items. Only component loadings greater than 0.4 (shown in bold) were retained to create moral inclusivity (MI) composite variables. N = 1141.

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

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

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

Table 1.2 Model estimates of mean attitude scores, donation odds ratios, and donation amounts, with 95% confidence intervals. The three levels of beneficiary are human only (HMN), nonhuman only (NON), and both human and nonhuman (COMB). Estimates are reported at average values of education, age, religiosity, income, and political orientation. For each subgroup of values reported by column, non-significant pairwise differences ($p > 0.05$) are denoted by shared superscript letters.

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

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

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

CHAPTER TWO
PATHWAYS FROM ENVIRONMENTAL ETHICS TO PRO-ENVIRONMENTAL
BEHAVIORS? INSIGHTS FROM PSYCHOLOGY

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Introduction

A recent report by the Intergovernmental Panel on Climate Change (2018, p. 21) urges that “rapid and far-reaching transitions” across all major socio-economic sectors of human activity are required to avoid catastrophic outcomes associated with global climate change. Arguably such a radical transition necessitates a fundamental shift in our human relationship with nonhuman nature (hereafter “nature”). Indeed, it was in a similar context of growing - now immanent - threat of global environmental crisis that the sub-sector of moral philosophy known as environmental ethics emerged (Callicott, 1984). In the past several decades, numerous scholars of the field have suggested that 1) Western society’s flawed ethical foundations are a root cause of humanity’s historic and ongoing damages to the environment; and 2) new ethical foundations are a necessary cornerstone of meaningful change (e.g., White, 1967; Routley, 1973; Jonas, 1984). Many scholars, in turn, have worked to defend the philosophical grounds for a new “environmental ethic.” Their largely theoretical agenda is to understand how humans should interact with nature, and also to explain why humans should not interact with nature in certain ways (e.g., pollution or deforestation). But the field of environmental ethics has practical aspirations as well, in that scholars pursue their theoretical agendas with the hope and expectation that the theories they develop will exert a positive influence in society (Callicott, 1994; Light, 2002; Rolston, 2012). It is presumed that if an environmental ethic were to become normalized – i.e., were it accepted and endorsed as people currently accept and endorse principles of justice and human rights – there would be a commensurate human behavioral shift in the direction of sustainability.

Philosophers do not naively assume that ethics translate directly into human conduct (see, e.g., Care, 2000), but there is a general sense, as succinctly stated by Callicott (1994, p. 5), that, “ethics exert a palpable influence on behavior.” And yet, environmental ethicists have scarcely considered how (or whether) an environmental ethic might actually influence human behavior, instead focusing primarily on the theoretical aspects of their agenda. Empirical characterization of the behavioral influence of an environmental ethic is beyond the purview of philosophical inquiry, strictly speaking, but this task does fall within the scope of psychology, a discipline with an

extensive scientific literature on human behavior, including sustainable or “pro-environmental” behaviors.³ In this essay, therefore, we adopt a psychological lens to assess the plausibility of presumed pathways from an environmental ethic to sustainable behavior. By “ethic” we mean a moral code, i.e., a web of values, norms, and beliefs that governs a person’s operative notions of right and wrong. In this sense an ethic represents an ideal of appropriate human conduct (Callicott, 1994). Understanding where our conduct does or does not reflect the ideal apprises us of our capacities and limitations as moral agents; and, over the long term, may also help us determine how to reduce discrepancies between actual and ethically ideal behavior.

Our objective, therefore, is to assess the influence an environmental ethic is likely to exert over individual human behavior. To meet this objective, we begin with the hypothetical case in which members of society at large have adopted an environmental ethic.⁴ By “adopt” we mean individual members of society accept and affirm the tenets of an environmental ethic, having values, beliefs, and/or emotions that are consistent with that ethic, and endorsing those values, beliefs and/or emotions as part of their moral codes. Drawing on relevant psychological research, we discuss whether and under what conditions an environmental ethic, if so adopted, might also be enacted, i.e., manifest in the form of pro-environmental behaviors. To focus our discussion we highlight three prominent but distinctive threads of scholarship in the environmental ethics literature, on

³ We use the word “sustainable” synonymously with “pro-environmental,” referring to behaviors that slow, reverse, or lessen humanity’s contribution to global environmental crisis, including pollution, land degradation, climate change, and biodiversity loss. Although behaviors in different domains have been theoretically and empirically differentiated from one another (e.g., Stern, 2000; Larson et al., 2015), it is beyond our scope to consider behavioral types independently. We preface our discussion with the caveat that results of empirical studies reported below do not necessarily generalize across domains of pro-environmental behavior. We also at times report behavioral intentions, rather than behaviors, since the former is a commonly used and usually more accessible metric. Meta-analyses of both correlational and experimental work suggest a reliable if not always strong relationship between these two behavioral variables (Armitage and Connor, 2001; Webb and Sheeran, 2006).

⁴ Although an interesting and important question, discussing how an ethic comes to be adopted by society at large is beyond the scope of the present essay. Interested readers are directed to consult sociological work on values and value change (e.g., Inglehart and Baker, 2000; Dunlap, 2008).

1) the intrinsic value of nature, 2) care ethics, and 3) Aldo Leopold's land ethic. Our intent is not to comprehensively review the literature in environmental ethics or psychology, but to synthesize key contributions from each.

To clarify, our hypothetical case posits that an environmental ethic has been adopted by individuals of a society, but does *not* assume it has become institutionalized (i.e., adopted formally or informally in the policies of governments, corporations, and other social organizations). We draw this distinction in efforts to understand the potential for an environmental ethic in itself to influence behavior, even (and particularly) when it is at odds with its larger socio-cultural context. Research discussed below suggests many individuals do subscribe to at least some tenets of an environmental ethic. Over time these tenets may become integrated into society's political, economic, legal, and larger social systems, but at present Western societies continue to be underwritten by a traditional ethic defined by anthropocentric, utilitarian norms and values (Purser et al., 1995; Bandura, 2007; Spahn, 2018). As such, isolating an environmental ethic from its broader social context is not only useful as an analytical exercise, in line with our stated objective, but also in some ways an accurate characterization of current social and moral reality.

Intrinsic value

Environmental ethicists have generated a vast literature on value in nature, and particularly the intrinsic value it possesses for its own sake, beyond any good it may serve for others (Vucetich et al., 2015).⁵ Entities attributed with intrinsic value are not properly regarded (or treated) as mere means to other ends; rather, they must be treated as worthy ends in themselves. Modern Western ethical theory largely presumed human beings as the sole bearers of intrinsic value (Callicott, 1989) until the latter half of the 20th century, when environmental ethicists began arguing that there is also intrinsic value

⁵ Intrinsic value is distinct from intrinsic motivations, which are motivations to act for the inherent interest or enjoyment of the activity; as contrasted with extrinsic motivations to act in order to achieve some other goal (Ryan and Deci, 2000). The distinction is important, since the intrinsic value of nature is likely to function as an extrinsic motivation for pro-environmental behavior.

in nature, or some part(s) of it (see Des Jardins, 2001). Once we acknowledge an entity (or its wellbeing) as a bearer of intrinsic value, we should also, arguably, acknowledge at least a basic obligation to respect that entity, and perhaps actively protect its interests (e.g., Taylor, 1981; Singer, 2011; Rolston, 2012; also Batavia and Nelson, 2017). In this way, an environmental ethic predicated on intrinsic value entails a “transition from *is* to *good* and thence to *ought*” (Rolston, 1991, p. 95).

To understand how such an ethic might influence behavior, we begin by consulting the psychological research on human values. Schwartz (1994, p. 21) defines values as, “transsituational goals, varying in importance, that serve as guiding principles in the life of a person or other social entity.” Values are often classified into clusters of similar types according to the motivations they express (Schwartz, 1994). For instance, the values “wealth” and “authority” express a motivation for power, whereas “equality” and “peace” express a motivation to achieve universal welfare. Values that express a motivation to honor and protect nature are sometimes referred to as “biospheric values” (Stern and Dietz, 1994; Stern et al., 1999), which are distinguished from social-altruistic values, i.e., goals related to human wellbeing; and egoistic values, i.e., goals related to one’s own wellbeing (Stern and Dietz, 1994; de Groot and Steg, 2008). Of these three value types, biospheric values are of greatest interest to the present discussion, as they appear to be a relatively close psychological analogue to the philosophical concept of intrinsic value in nature (de Groot and Steg, 2008).

Many studies have reported direct, positive correlations between biospheric values and pro-environmental behaviors or intentions (e.g., de Groot and Steg, 2010; Thomas and Walker, 2016; Katz-Gerro et al., 2017). Others investigate values as one link in a chain of cognitions (i.e., thoughts) leading to behavior or behavioral intentions. One such chain of cognitions is articulated in the value-belief-norm (VBN) theory of pro-environmental behavior (Stern et al., 1999). VBN theory can be interpreted as a psychological specification of the relationship outlined by Rolston (1991), whereby ethical duties or obligations are grounded in notions of value. According to the theory, values underpin generalized beliefs, i.e., worldviews organized around ideas about humans and nature. Generalized beliefs in turn underpin two more specific beliefs: 1)

awareness of consequences, the belief that some valued object faces harm, and 2) ascription of responsibility, the belief that one is personally responsible for alleviating the situation. These specific beliefs theoretically “activate” personal moral norms (i.e., duties or obligations), leading one to engage in helping behavior (Stern et al., 1999). A large body of empirical work has tested VBN in the context of pro-environmental behaviors (see Turaga et al., 2010), and researchers generally find that biospheric values predict a range of pro-environmental behaviors or intentions along the pathways proposed by the theory (e.g., Steg et al., 2005; van Riper and Kyle, 2014).

Yet, while the “value” terminology is shared between ethics and psychology, we should not assume scholars’ conceptions of biospheric values and intrinsic value are interchangeable. Philosophically, value is conceptualized as a property of objects or states of affairs, which elicits a particular (usually favorable) disposition (see Batavia and Nelson, 2017). Psychologically, values are conceptualized as goals or abstract end states that humans aspire to reach or achieve (Schwartz, 1994). At first glance it may appear these two notions of value are readily reconciled if we can assume people who hold biospheric values (i.e., desire the wellbeing of nature) also ascribe intrinsic value to nature (i.e., believe nature is valuable regardless of its utility to people). However, philosophers have pointed out that the intrinsic value of nature cannot be deduced solely on the basis of the fact that a person wants or chooses to protect it (Peterson and Sandin, 2013; Weber, 2017), an observation corroborated by careful examination of the survey items used to measure biospheric values. These items ask people to rate the importance of five values (unity with nature, a world of beauty, protecting the environment, preventing pollution, and respecting the earth) as “guiding principles” in their lives (Stern and Dietz, 1994). One might attach strong importance to any of these without believing nature has value beyond what it provides humans. For instance, a person might consider unity with nature important if she believes the long-term survival and welfare of human beings require people to live in unity with nature. Although endorsement of biospheric values is certainly consistent with the ascription of intrinsic value to nature, the former does not necessarily indicate the latter.

More direct evidence linking an ethic predicated on intrinsic value to pro-environmental behavior may emerge from a growing body of psychological research that explicitly measures ascriptions of intrinsic value to nature (e.g., Vucetich et al., 2015; Lute et al., 2016; Lute and Attari, 2017). Vucetich et al. (2015), for example, asked people affiliated with five wildlife stakeholder groups (local residents, hunters, anglers, trappers, and wildlife watchers) to indicate their agreement or disagreement with the statement, “Wildlife have inherent value, above and beyond their utility to people.” Unlike the items listed above, which operationalize biospheric “values” in the psychological sense, this item is clearly commensurate with the philosophical understanding of “value” as a property of an object or entity.⁶ Only limited research has related direct measures of intrinsic value with environmentally relevant behaviors, producing mixed results. In an online survey of Michigan (USA) residents, the ascription of intrinsic value to wolves (or not) predicted five specific conservation behaviors (Lute et al., 2016). On the other hand, Vucetich et al. (2015) found that the five aforementioned stakeholder groups could not be strongly differentiated by whether they ascribed intrinsic value to wildlife, as majorities in all five groups did. The direct measure of intrinsic value also only weakly predicted attitudes toward the use of lethal management (i.e., killing a bear) in two hypothetical human-wildlife conflict scenarios.

Exemplifying the significance attached to intrinsic value in the philosophical literature, environmental ethicist Holmes Rolston, III (1991, p. 92) wrote, “In practice the ultimate challenge of environmental ethics is the conservation of life on Earth. In principle the ultimate challenge is a value theory profound enough to support that ethics.” Results reported by Vucetich et al. (2015) suggest ascribing intrinsic value to wildlife, and perhaps other parts of nature as well, may exert some influence over an individual’s behavior; but perhaps to a far lesser degree than is presumed in the environmental ethics

⁶ There is some debate in the environmental ethics literature as to whether intrinsic value is an objective property of an entity, or an attribution of a subjective human valuer (see Batavia and Nelson, 2017). The direct measure of intrinsic value used by Vucetich et al. (2015) does not favor either interpretation.

literature.⁷ Indeed, research generally demonstrates that the influence values exert over behavior is constrained by a suite of factors.

For example, people hold multiple values aligned with multiple motivational domains, some of which directly pertain to the environment, and some which do not (Schwartz, 1994; Steg, 2016). In general, values that are activated in context are most likely to influence behavior, particularly when they are central to one's sense of self (Verplanken and Holland, 2002; Steg, 2016). A person may generally desire the protection of nature, but this goal may be relatively unimportant, and therefore relatively non-influential, when the person is deciding whether to drive across the country to visit family over the holidays. Even though resulting gas emissions would counteract the goal of nature protection, other, perhaps more important goals such as respect for tradition, belonging, and meaning in life are more likely to influence the person's decision in this case (Schwartz, 1994).

Values also potentially compete in importance with social and situational factors (Steg, 2016), which may facilitate or inhibit linkages between notions of value and pro-environmental behaviors. For example, a person may have an overall positive attitude toward polar bear habitat conservation, based in part on the ascription of intrinsic value to polar bears (Ajzen, 2012). However, this attitude may exert relatively little influence over specific commuting behaviors, for example, if the individual does not feel she has viable transportation options other than her personal vehicle; or if important others (e.g., family or friends) disparage the use of public transit. Along with attitudes, these two variables - one's perceived ability to act ("perceived behavioral control") and social influence (a.k.a. "social norms") - are key predictors of behavioral intentions according to the theory of planned behavior (TPB), another psychological theory often used to explain pro-environmental behavior (Ajzen, 2012).

⁷ But conceivably a statutory declaration of wildlife's intrinsic value, with associated policies, would exert stronger influence. For instance, Callicott (2006) argues that the US Endangered Species Act implicitly acknowledges the intrinsic value of species. This law has been used to effectively halt or reverse the decline of threatened and endangered species for over forty years (see, e.g., Taylor et al., 2005).

In a recent meta-analysis, Klöckner (2013) quantified the relative influence of a range of predictors of pro-environmental behaviors, integrating variables from VBN and TPB, as well as habit (i.e., routine, non-deliberative actions). Although he found that values were antecedents to personal norms, as specified by VBN, personal norms had only an indirect relationship with behavior via intentions, which were also predicted by perceived behavioral control, social norms, and attitudes. Apropos to the present discussion, Klöckner's (2013, p. 1035) results led him to conclude, "It is obvious that the path from values to behavior is long and can be interrupted by many variables."

Both according to direct measures of intrinsic value and, perhaps, as implied by broad endorsement of biospheric values, there is some evidence to support a linkage between an environmental ethic predicated on nature's intrinsic value and pro-environmental behaviors.⁸ By the same measures, research suggests nature's intrinsic value is generally a non-controversial proposition, at least in Western contexts (e.g., Schultz and Zelezny, 1999; Teel and Manfreda, 2009; Vucetich et al., 2015; Steg, 2016). However, these observations should not lead us to conclude humans are overall more likely to engage in sustainable behaviors than not. Although the basic ascription of intrinsic value to nature may under some circumstances underpin sustainable behavior, we should not expect individuals to unfailingly engage in behaviors that are congruent with values professed at an abstract level.

Care ethics

In the environmental ethics literature, normative theories centered on intrinsic value suggest people should appropriately value nature by acknowledging its direct moral standing and honoring concomitant moral obligations. An ethic predicated on nature's intrinsic value, in this sense, primarily involves proper thoughts, or cognitions, regarding nature. A separate thread of literature offers a somewhat different account. Scholars in

⁸ We strongly recommend future research testing the discriminant and convergent properties of biospheric values and direct measures of intrinsic value, in efforts to determine the extent to which inferences can be drawn from one line of research to the other.

the ecofeminist tradition emphasize emotions such as compassion, love, and empathy as the foundation of morality. Mathews (1991, p. 160), for example, recommends,

teaching our hearts to practice affirmation, and...awakening our faculty of active, outreaching, world-directed love. Though a tendency to 'tread lightly' on the earth, and to take practical steps to safeguard the particular manifestations of Nature, will flow inevitably from such an attitude, the crucial contribution will be the attitude itself, a contribution of the heart and spirit.

Ecofeminists argue that morally appropriate conduct entails not only or even primarily acting in accord with some abstract set of beliefs or principles. Instead, our moral obligations and responsibilities stem directly from our relationships with specific others, and the care we feel for them (Cheney, 1989; Warren, 1990; Plumwood, 1993).

Because an environmental ethic of care is at core an emotional response, in this section we consider some of the psychological research linking certain caring emotions, *viz.*, empathy and compassion, with pro-environmental behaviors. Empathy involves sharing another's emotional state, and generally fosters concern for the other's wellbeing (Eisenberg and Fabes, 1990). Researchers have persuasively demonstrated that empathy can altruistically motivate humans to help other humans (e.g., Eisenberg and Fabes, 1990; Batson, 1997), and an increasing body of work suggests it may also motivate people to "help" nature, i.e., by engaging in pro-environmental behaviors. Tam (2013b), for example, found that a dispositional tendency to empathize with nature (specifically "animals and plants") is associated with pro-environmental behaviors. Berenguer (2007) found that people who were induced to empathize with a tree donated more money to an environmental cause than respondents who were not in a heightened empathic condition (also Walker and Chapman, 2003; Swim and Bloodhart, 2015). Closely related to empathy is compassion, a distinct rather than shared caring emotion experienced in response to another's suffering, which also often generates a desire to help (Goetz et al., 2010). Compassion has received comparatively less research attention than empathy in the context of pro-environmental behavior. Pfattheicher et al. (2016) found that compassion for other humans predicts pro-environmental behavioral intentions, but to our knowledge researchers have not investigated whether compassion for nature itself (or

some part of nature) is associated with similar outcomes. To the extent that empathy and compassion are analogous constructs (Goetz et al., 2010), the research on empathy referenced above suggests compassion may also engender sustainable behaviors. But some researchers suggest empathy and compassion are discrete emotions, even reporting evidence that compassion may more effectively motivate inter-human helping than empathy (Singer and Klimecki, 2014). We therefore suggest compassion merits explicit research attention as an antecedent to pro-environmental behavior, especially given recent calls to integrate compassion for individual wildlife into the science and practice of conservation (Wallach et al., 2018).

Overall, research provides evidence to link care for certain elements of nature with sustainable behaviors. However, as King (1991, p. 80) observed, “if ‘nature’ is not a single thing, then we must ask what ‘nature’ ecofeminism cares about.” To reiterate, environmental ethics of care are grounded in our specific relationships with nonhuman entities (e.g., Warren, 1990; Plumwood, 1993). Adopting an ethic of care, as such, does not involve caring for “nature” writ large, but rather caring for nature in its diverse particularities. Although this liberates us from impersonal and absolutist moral rules (Plumwood, 1993), it also means our ethics extend only as far as our relationships and our capacities for care. Research suggests these capacities may be inherently constrained by an overarching human tendency to favor others who are perceived as close, familiar, or similar to ourselves (e.g., Montoya et al., 2008; Bastian et al., 2012a). Hollar (2017), for example, developed an Empathy Gradient Questionnaire, hypothesizing that empathy would generally decline as the perceived social distance between self and other increases. Supporting his hypothesis, he found a decrease in empathy for targets ranging from friend to peer to distant other to nonhuman entity. Other research corroborates these results, showing that people empathize less with nonhuman animals that are phylogenetically dissimilar from humans (Harrison and Hall, 2010).⁹ While humans can certainly empathize with select, apparently humanlike nonhuman beings, such as mammals (Westbury and Neumann, 2008; Harrison and Hall, 2010), it seems other elements of

⁹ Interestingly, the same has been found of robots (e.g., Kuchenbrandt et al., 2013).

biodiversity such as invertebrates, plants, species, or ecosystems are less likely to elicit the same emotional - and behavioral - responses.

Macro-scale social and structural influences may also enable or actively encourage people *not* to care for nature, in part or in whole. “Moral disengagement” refers to the phenomenon whereby humans selectively suspend (i.e., “disengage”) the internal controls that serve to self-regulate conduct, and lead us to act in accord with our moral standards. By so disengaging, we can avert or avoid the self-sanctions (e.g., feelings of guilt or shame) that would otherwise accompany the violation of these standards (Bandura, 1991; Bandura et al., 1996). Moral disengagement takes various forms, which include dehumanizing the victims of one’s actions; displacing personal responsibility onto others; and using euphemistic language (Bandura et al., 1996). Western society may facilitate such processes of moral disengagement, often in ways that prevent or stifle care for nature (Bandura, 2007). For example, the environmental impacts of energy use, consumer choices, and waste removal (among other things) are generally concealed in post-industrialized societies, allowing people to remain comfortably oblivious to nonhuman (and human) victims of their actions, and thereby avoid associated dissonance (Dauvergne, 2010). Euphemistic or sanitized language masks the harms (and victims) associated with certain practices, e.g., when we refer to clearcutting as “even-aged management” or killing animals as “wildlife control” (Houck, 2001; see also Plous, 2003; Serpell, 2004; Bastian et al., 2012b; Piazza and Loughnan, 2016). In these and other ways, society creates physical and/or psychological distance between humans and nature, or certain parts of it, precluding connections or relationships that might otherwise foster caring emotions such as empathy or compassion.

Researchers have found that people who are less empathetic are more likely to morally disengage (Detert et al., 2008; Niemyjska et al., 2018). It remains unclear whether social practices and institutions promoting moral disengagement, as discussed above, can actually inhibit empathy or other caring emotions (see Zaki, 2014 for discussion about how the experience of empathy - or not - can be motivated by social or situational factors). We highlight this as an important direction for future research. For now we offer the observation that an ethic of care cannot influence human behavior if

humans do not experience caring emotions; and we hypothesize that caring emotions are unlikely to arise where the social context discourages, de-incentivizes, or even actively suppresses them.

The land ethic

The land ethic, as advanced in the seminal work of Aldo Leopold (1966, p. 262), embraces as a fundamental ethical principle that, “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.” Leopold viewed an ethic as a cornerstone of human society, regulating interpersonal conduct within a network of cooperative relationships. Whereas conventional ethics governed conduct exclusively within the human social realm, he suggested, “the land ethic simply enlarges the boundaries of the community to include soils, waters, plants and animals, or collectively the land” (Leopold 1966, p. 239).

Leopold’s ideas were developed by environmental ethicist J. Baird Callicott (1989), who brought scholarly rigor to Leopold’s prescient if philosophically underspecified writings. Integrating cognitive and emotional elements of the two ethics examined above (intrinsic value and care), Callicott (1989) argued the land ethic is in part a reasoned belief, but also an expression of the social sentiments such as care, love, and attachment, which bind communities together. In this sense, Leopold’s land ethic involves,

not only the moral sentiments, but also an expansive cognitive representation of nature.... this is the biotic community of which we are a part, these are our companions in the odyssey of evolution, and it is to them, not to any future complement, that our loyalties properly extend. (Callicott, 1989, p. 152)

Based on Leopold’s own writings and Callicott’s later interpretations of his work, the land ethic can be understood to entail two core components. First, a land ethic is grounded in the ecology of a specific place, “the land,” which includes the biota and the abiotic environment. To understand how such a place-based ethic might influence behavior, we consult the psychological research on sense of place.

Masterson et al. (2017) define “sense of place” as a pairing of place meaning, which is a cognitive representation of place and its significance, and place attachment, which is an emotional bond with place. In some cases place attachment, *per se*, has been found to predict pro-environmental behavior (Halpenny, 2010; Scannell and Gifford, 2010; Raymond et al., 2011). More precisely, though, people become attached to salient place meanings (Wynveen et al., 2012), and it is these specific meanings they seek to protect (Brehm et al., 2013; Anderson et al., 2017). The psychological research on place suggests people whose sense of place involves an emotional attachment (the “moral sentiments”) to a particular geographic place (“the land”) imbued with a certain meaning (“integrity, stability, and beauty”) would likely act to protect those valued meanings, e.g., by engaging in environmental stewardship behaviors.

However, literature on place provides few insights into the second core component of Leopold’s land ethic, *viz.*, its inherently non-anthropocentric vision of humans as “plain members and citizens” of the biotic moral community (Leopold, 1966, p. 240).¹⁰ To understand how such a sense of integration or kinship with nature might influence behavior, we consult the variegated body of research on connectedness to nature. Mayer and Frantz (2004), for instance, developed a “connectedness to nature” (CNS) scale to operationalize the biotic community sentiment underpinning Leopold’s land ethic. Using this and similar measurement instruments (see Tam, 2013a for a review), researchers have found that individuals who feel related to or connected with nature often report pro-environmental behaviors or behavioral intentions (e.g., Obery and Bangert, 2017; Yang et al., 2018). This research, again, provides some evidence to support a linkage between Leopold’s land ethic and sustainable behavior. But most measures of connectedness refer abstractly to “nature,” or some part(s) thereof. Items from the CNS scale, for example, ask respondents to indicate their level of agreement with statements such as, “I think of the natural world as a community to which I belong,”

¹⁰ The psychological construct “community attachment,” which is closely related to place attachment, may seem relevant. However, “community” in this line of research refers specifically to the social (human) community (see Trentelman, 2009). To our knowledge, community attachment has not been used as a framework for understanding human-nature relationships.

or “I often feel a kinship with animals and plants” (Mayer and Frantz, 2004; see also Tam, 2013a). If the psychological research on place does not capture the quintessential community element of the land ethic, research on nature connectedness lacks sense of place altogether. We therefore recommend future work integrating elements of both sense of place and nature connectedness, allowing researchers to understand Leopold’s land ethic more holistically, and especially as it may relate to sustainable behavior.

The literatures on place and nature connectedness provide indirect and suggestive evidence to link a land ethic with pro-environmental behavior, but some researchers have more directly investigated people’s “land ethics” as well. For example, in a recent study by Vaske et al. (2018), a sample of Illinois (USA) farmers felt their relationship with land could be characterized as caring, cooperative, and harmonious. This “mutualistic” orientation to land predicted agreement with a set of statements expressing land stewardship obligations, drawn directly from Leopold’s writings. Although Vaske et al. (2018) did not measure actual stewardship behavior, other studies suggest a land ethic rooted in the value of ecological health and/or integrity may be associated with sustainable land use practices. For example, Turner et al. (2014) found that farmers and ranchers who professed a land ethic rooted in the importance of an ecosystem’s long-term health, rather than its productivity, *per se*, favored land use decisions promoting conservation over intensive commodity production (see also Brown and Harris, 1998; Schneider and Francis, 2006; Lien et al., 2017).

Research on land ethics has generally been conducted in rural settings among farmers, ranchers, or foresters, but a current and growing majority of the world’s human population lives in urban areas (United Nations, 2018), where the ecology and natural history of local environments remain largely foreign to city residents (Miller, 2005). Environmental education in urban settings may be able to cultivate an “ecological place meaning,” perhaps akin to a land ethic (Kudryavtsev et al., 2012; Russ et al., 2015), but it has not been demonstrated that urban residents who have such an “ecological” sense of place are more likely to engage in pro-environmental behaviors. In fact, research generally suggests only a weak relationship between professed environmental beliefs and pro-environmental behaviors in cities. For example, Berenguer et al. (2005) found that

urban residents reported strong generalized environmental concern, which nonetheless did not translate into pro-environmental behavioral intentions (see also Walton and Austin, 2011; Echegaray and Hansstein, 2017). Urban residents may lack the financial means or sense of empowerment to practice pro-environmental behaviors, while administrative and resource constraints may limit sustainable initiatives at the municipal level (Lee et al., 2013; Kronenberg, 2015). Similar barriers may impede rural residents from enacting land ethics (e.g., Van Noordwijk et al., 2008; Constance and Choi, 2010). However, city residents also face an additional barrier, which Kabisch et al. (2016) call a “paradigm of growth,” an urban lifestyle that promotes consumption and economic development over environmental stewardship and conservation. Even if a person endorses the core tenets of a land ethic, believing humans have an obligation to act as responsible stewards and members of their biotic communities, the norms and mores associated with this urban paradigm are likely to constrain and even counteract any influence such beliefs exert over her behavior.

Discussion and conclusions

We set out to understand whether it is plausible that an environmental ethic, in itself, could influence human behavior in the direction of sustainability. The most general response we can offer is a qualified, “perhaps, under some circumstances.” Psychological research provides suggestive evidence that an ethic predicated on the intrinsic value of nature may underpin sustainable behaviors, but also shows that the linkages between value and behavior are indirect and prone to deviation. An ethic of care can lead to pro-environmental behaviors, but our psychological inclinations and social institutions may limit its influence. And a land ethic predicated on the value of ecosystem health and integrity may engender stewardship behaviors, but prevailing social mores, institutions, and infrastructure may bound the influence of such an ethic, particularly in urban areas.

A recurring theme of the discussions above is the enabling and often inhibiting role of the larger context. Ethics are embedded within a complex socio-cultural sphere, which both conditions and constrains patterns of thought, feeling, and behavior (Haidt, 2012; Manfredo et al., 2017; Pisano and Lubell, 2017). Individual or personal norms are

not entirely without influence, but if the decision space within which we move does not facilitate sustainable action, even robust ethical commitments may have limited behavioral influence.

Still, by laying out a vision for appropriate values, beliefs, emotions, and meanings, an ethic describes a positive aspiration for appropriate human behavior. Thus conceived, an environmental ethic may be an integral component of a progressive social discourse re-defining Western social norms and cultural identities (Manfredo et al., 2017). Throughout the discussion above we maintained a distinction between an ethic, understood as a moral code adopted by individuals or even endorsed by members of society at large, and the broader social context, which necessarily constrains specific instances of behavior. Psychological research suggests we should temper expectations concerning how an ethic thus understood (i.e., as a moral code) influences individual behavior. However, an environmental ethic that supports and is supported by larger institutional structures (e.g., systems of governance, economic systems, and statutory law) could potentially transform how we relate to the world, and even how we view basic goals in life (Manfredo et al., 2016). Indeed, the word “ethic” shares a root with *ethos*, meaning “custom.” It is in this broader sense of “ethic” not just as an individual moral code but as a shared, habituated, and institutionalized set of social practices that an environmental ethic becomes a critical cornerstone of sustainability.

As a philosophical discipline, environmental ethics may have a key role to play in developing and disseminating appropriate moral narratives about humans, nature, and the relationship between them. In this role it is essential that environmental ethicists communicate effectively with diverse publics using accessible language and compelling rhetoric. Psychologists can support these efforts by identifying key constraints that inhibit either comprehension of or receptivity to ethical argumentation. The discussion herein has hopefully established common ground to foster dialogue between these disciplines. By engaging in interdisciplinary collaboration, environmental ethicists and psychologists may be able to develop ethically and empirically sound recommendations for managers, policymakers, and other cultural leaders seeking to support and encourage sustainable human behavior.

CHAPTER THREE

DO WE VALUE BIODIVERSITY AS WE SHOULD?

AN EXPLORATORY STUDY

Introduction

Conserving Earth's biological diversity requires not only an understanding of the world as it is, but also a notion of how it ought to be, and how we ought to behave as moral agents within it. Conservation, in this sense, is a marriage of science and ethics (Soulé, 1985; Barry and Oelschlaeger, 1996). Soulé (1985) articulated as the first ethical postulate of conservation biology that biodiversity has intrinsic value, a proposition that has been echoed widely across the conservation community. It is stated, for example, as the first organizational value of the Society for Conservation Biology (2018), and reiterated as a first precept in the preamble to the United Nations (1992) Convention on Biological Diversity. These are succinct, practical expressions of ethical values and beliefs, but the arguments underpinning them are most fully articulated in the philosophical literature in environmental ethics.

Environmental ethics uses systematic methods of rational inquiry and analysis to understand how humans ought to conduct themselves in relation to Earth and its biodiversity. Thus, theory in environmental ethics is normative, or action-guiding; it does not purport to *describe* what people believe and how they act, but to *prescribe* what people should believe and how they should act, as rational moral agents. But from a psychological standpoint, humans are known to be neither strictly rational nor singularly moral, influenced as well by emotion, intuition, social norms, and political ideologies, among other things (Kahneman et al., 1982; Greene and Haidt, 2002; Haidt, 2007; Graham et al., 2009). Given this complex web of influences, how humans actually view and value biodiversity is likely to diverge at least somewhat from how prescriptive ethics suggests humans ought to view and value biodiversity, i.e., as rational moral agents. The present research is an exploratory effort to probe this space at the intersection of ethics and human psychology, evaluating the extent to which people value biodiversity as they (arguably) should, i.e., according to normative theory.

The word “value” has different meanings across disciplines, but one particular conceptualization of value is of special interest to environmental ethicists: intrinsic value. By attributing an entity with intrinsic value, we acknowledge that the entity is good for its own sake, above and beyond any benefits it may or may not provide others (Vucetich et al., 2015). Entities attributed with intrinsic value have direct moral standing as members of the *moral community*, a central metaphor in environmental ethics and, perhaps, a useful term for the conservationist lexicon. The moral community describes who matters, in a moral sense (Nelson, 2009). Put differently, the moral community is populated by all the entities that may be foci of our moral obligations. Our most basic obligation is to acknowledge these entities as bearers of intrinsic value and consider how our actions may affect them; but there may be more exacting obligations as well, e.g., to respect them, protect them, or actively promote their interests (e.g., Goodpaster, 1978; Taylor, 1981; Rolston, 2012).

Western moral philosophers historically pointed to specific morally relevant traits, such as sentience or reason, as the seat of intrinsic value (e.g., Bentham, 1970; Kant, 2002). As long as humans alone were believed to possess these traits, humans alone were attributed intrinsic value and granted direct moral standing. In the late 20th century environmental ethicists began arguing against this narrow conceptualization of the moral community, many of them employing a line of argumentation called “extensionism” (Nelson, 2009). On grounds of rational consistency, the argument runs, nonhuman entities possessing whichever trait is used as a criterion of intrinsic value in humans should also be attributed intrinsic value, and therefore granted direct moral standing in the moral community.

A large literature in environmental ethics debates the appropriateness of four major *worldviews*, each prescribing a moral community populated with certain types of entities. According to extensionist logic, these different worldviews are justified by different criteria of intrinsic value. An *anthropocentric* worldview takes humanness itself as the criterion, such that only humans should be included within the scope of the moral community (Pinchot, 1947; Baxter, 1974). Semantically a *zoocentric* worldview implies the inclusion of all animals, but usually the moral community it connotes is more

selective. Extensionist theories associated with zoocentrism do not defend the moral standing of animals as animals, *per se*, but rather based on criteria such as their sentience (Singer, 2011) and/or subjective experience (Regan, 1983). The labels “sentientism” or “pathocentrism” better reflect these positions, and are at times used in the environmental ethics literature (e.g., Weston, 1985; Muraca, 2011). However, in this paper we use the term “zoocentrism” (Callicott and Grove-Fanning, 2009; Nelson, 2009; Carter, 2011), which best matches our operational measure of the worldview (see Methods). A *biocentric* worldview includes all individual living organisms, on grounds that life itself (i.e., being alive) is the appropriate criterion of intrinsic value (Taylor, 1981; Agar, 2001). Finally, some scholars argue the moral community should include ecological collectives, such as species and ecosystems, because, like individual organisms, these entities also have vital interests in persistence and/or flourishing (Johnson, 1992; Rolston, 2012). Possessing such vital interests, on this account, is the operative criterion of intrinsic value, engendering an *ecocentric* worldview.¹¹ There are also influential non-extensionist theories of ecocentrism in environmental ethics. We address some of these later.

On the extensionist account, anthropocentrism, zoocentrism, biocentrism, and ecocentrism can be understood as a series of accretions, such that the moral community of each worldview lower in the series is nested within the moral community of each worldview higher in the series. For example, if one acknowledges sentience as the operative criterion of intrinsic value, one’s moral community should include many nonhuman animals in addition to human beings (who also, of course, meet the criterion of sentience). In this way, a zoocentric worldview builds upon an anthropocentric worldview. Because the prescribed scope of the moral community simply expands as it diversifies, accretive worldviews can be distinguished by their comparative *moral inclusivity*, with anthropocentrism being least inclusive and ecocentrism being most inclusive. But environmental ethicists have discussed select non-accretive worldviews as well. For example, *misanthropy* refers to the inclusion of at least some nonhuman entities, but the exclusion of human beings (Gerber, 2002; see also Attfield, 1998). *Eco-fascism*, on the other hand, characterizes moral communities that include collective nonhuman

entities, but not individual nonhuman organisms (Regan, 1983; see also Marietta, 1988; Vucetich and Nelson, 2007). These are generally regarded as inappropriate notions of the moral community.

To our knowledge, research has not tested whether or the extent to which the four accretive worldviews prescribed by extensionist theory accurately describe how people actually populate their moral communities. Our first objective, therefore, is to empirically assess the proportion of people who can be affiliated with anthropocentrism, zoocentrism, biocentrism, or ecocentrism.

Extensionist theories characterize the appropriate constitution of the moral community in terms of abstract, criterion-based sets of entities (e.g., individual living organisms), but in practice conservation efforts are targeted toward specific entities (e.g., African lions, *Panthera leo*; or Kincaid's lupine, *Lupinus oreganus*). From a practical perspective it is perhaps more important to understand how people's moral communities are constituted with these specific elements of biodiversity. According to extensionist reasoning, which, to reiterate, is predicated on the logical imperative of rational consistency (Nelson, 2009), one's moral community should include every entity in existence that meets one's acknowledged criterion of intrinsic value. If one professes to believe entities meeting the criterion of "being alive" are included in the moral community, then every living organism – be it a lion or a lupine, and a lawyer as well – should be included. We refer to this philosophically prescribed alignment of beliefs as *internal consistency*.

If the prescriptive proposition that we ought to be internally consistent seems reasonable, the descriptive proposition that we are internally consistent seems questionable. As noted above, human conduct is not solely or even primarily an exercise of rational consistency. A lawyer, a lion, and a lupine are all living organisms, and yet intuitively it seems people are likely to perceive some salient differences between them, which may also translate into a distinction in direct moral standing. Our second objective, therefore, is to evaluate the extent to which people affiliated with one of the four accretive worldviews demonstrate internal consistency by including all (and only) specific entities meeting their respective criteria of intrinsic value.

Interdisciplinary efforts of this sort, which employ social scientific methods to empirically probe normative theory, can enrich our understanding of human morality as a psychologically and socially situated phenomenon. If philosophical prescription does not in fact describe how people value biodiversity, there are potentially important implications for both ethical theory and conservation practice. We discuss some of these in the conclusion.

Methods

To pursue our objectives, we developed a scale of moral inclusivity.¹² The moral inclusivity scale, available in Appendix A, was embedded in a larger survey designed to investigate the value basis and effectiveness of conservation outreach messages. The survey was administered online to a non-representative sample of the American public in August 2017 (N = 1331) using panel services provided by Qualtrics, LLC (see Batavia et al., 2018 for a detailed description of data collection procedures). Panelists were generated from a database of individuals contracted with Qualtrics to take surveys for compensation. Internet panels represent improvements in speed, cost, and convenience over conventional (e.g., in-person) survey methods, but have important limitations as well (Hays et al., 2015). Online panels are a form of convenience sample, comprised of self-selected participants with access to the Internet and time to complete surveys. As such, they do not necessarily represent the larger population. The sample was selected to meet the objectives of the larger study (Batavia et al., 2018a), and although we deemed it sufficient to meet the objectives of the present exploratory study, results reported below cannot necessarily be generalized to the broader American public.

Moral inclusivity

The moral inclusivity scale had two parts. The first part measured what we call “criterion-based inclusivity,” i.e., the extent to which respondents’ moral communities include broad classes of entities, as characterized by the four extensionist criteria of

¹² The scale is conceptually similar to Crimston et al.’s (2016) scale of “moral expansiveness,” but more explicitly informed by extensionist theory.

intrinsic value: humanness (three items), sentience/subjectivity (two items), life (two items), and vital interests (six items). These criteria are relatively abstract and somewhat technical; “sentience,” for example, may not be a familiar concept for many people. Therefore, instead of identifying sets of entities explicitly by their respective criteria, we used familiar proxies for these sets.¹³ “Animals” represented the set of sentient/subjective beings; “plants” represented the set of individual living organisms; and both “species” and “ecosystems” represented the set of collectives arguably possessing vital interests.¹⁴ Before replying to the three “species” items, respondents read a short block of text describing species as cohesive and integrated entities, focusing their attention on the collective, *per se*, rather than its individual members. Similar text was presented before the three “ecosystem” items.

The second part of the scale measured “entity-based inclusivity,” i.e., the extent to which respondents’ moral communities include specific human and nonhuman entities. In this part respondents were presented with two prompt statements. The first prompt (henceforth “harm”) stated, “If I had to decide whether or not to do something that would harm _____, I would be making a moral decision.” The second (henceforth “value”) stated, “_____ has value above and beyond any use it may serve for others.” Respondents were asked to fill in the blank, one at a time, with a battery of specific entities supplied in a matrix following each prompt. For each specific entity, respondents indicated the extent to which they disagreed or agreed with the prompt. The matrices listed 13 specific nonhuman entities of three different types, which mirrored the extensionist criterion-based sets: five animals (dog, bald eagle, cow, cougar, fly), four

¹³ Given the accretive nature of extensionist criteria, naming them explicitly may have also enhanced the likelihood of measurement error. For instance, items referring to “individual living organisms” may have elicited a mental representation of a plant or a sentient animal, or even a human being. Items so phrased may, but do not necessarily, indicate biocentric beliefs.

¹⁴ We assumed “animal” would elicit a mental representation of a familiar animal meeting the criteria of sentience and/or subjective experience. This assumption is justified by psychological research on categorization, discussed below. However, the possibility that “animal” was not associated with these criteria is a potential limitation of the present work. Future research should determine more precisely how “animal” is interpreted, and refine the scale as necessary.

vegetative organisms (oak tree, houseplant, fungus, poison ivy), and four ecological collectives (endangered elephant species, local mosquito species, tropical rainforest ecosystem, agricultural ecosystem). Nonhuman entities were selected to vary in familiarity, harmfulness, and utility, attributes that have been found to predict the moral standing of nonhuman animals (see Discussion). For baseline comparison we also presented four specific human entities (myself, my family, other Americans, people in other countries) in the matrix following the harm prompt. Because some of these entities were grammatically incompatible with the value prompt, they were not included in the value matrix.¹⁵

All items employed bipolar response scales ranging from 1 to 7 (strongly disagree to strongly agree). Conceptualizing moral inclusivity categorically, such that an entity is either included in or excluded from the moral community, inclusivity scores of 1-3 indicate the entity is excluded and scores of 5-7 indicate the entity is included. A score of 4 indicates the entity is simply “not included” in the moral community, i.e., neither included nor actively excluded.

The scale also allowed us to conceptualize moral inclusivity as a continuous variable, although it is unclear how the range of scores should be interpreted. For example, scores closer to the anchor points on the scale may indicate a belief is more important to sense of personal or social identity; or held with greater certainty (e.g., Krosnick et al., 1993). This ambiguity is a limitation of the study, and the moral inclusivity scale warrants further assessment and refinement in future research. Of each respondent we can only infer that higher scores indicate relatively stronger beliefs in the direction of moral inclusion, whereas lower scores indicate relatively weaker beliefs in the direction of moral inclusion. We refer to this as a continuum of “inclusivity strength,” with the precise meaning of “strength” unknown.

Statistical analysis

¹⁵ For example, “Myself has value above and beyond any use it may serve for others” is not a grammatically correct formulation.

Data manipulation and analysis were conducted in SPSS (v.25). We used the 13 criterion-based inclusivity items to affiliate respondents with extensionist worldviews (Table 3.1). Using Cronbach's alpha, we first tested internal reliability of the items associated with each of the four extensionist criterion-based sets. Alpha met conventional levels of acceptability for animals ($\alpha = 0.81$), plants ($\alpha = 0.71$), and collectives ($\alpha = 0.88$), so respondents' individual item scores were averaged to create a composite measure for each set. Reliability for humans fell below acceptable levels ($\alpha = 0.46$), and the second item in particular performed differently than the other two. Omitting this item only increased alpha to 0.50, which still falls below conventionally acceptable levels (Vaske, 2008). For the present analysis it sufficed to simply use the two relatively consistent human items independently, as described next, but future work should refine these items to enhance measurement reliability.

We next created four groups (hereafter "worldviews") representing anthropocentrists, zoocentrists, biocentrists, and ecocentrists (see Table 3.1). Affiliation with a worldview indicates a respondent actively included certain sets of entities in the moral community (i.e., scores of five or above on relevant items or composites), and did not include the other sets (i.e., scores lower than five on relevant composites).¹⁶ Respondents with scores of five or above on the two human items and below five on animal, plant, and collective composites were classified as "anthropocentrists." Respondents with scores of five or above on the two human items and the animal composite, but below five on the plant and collective composites, were classified as "zoocentrists." Respondents with scores of five or above on the two human items, the animal composite, and the plant composite, but below five on the collective composite, were classified as "biocentrists." Respondents with scores of five or above on the two human items and all three composites were classified as "ecocentrists."

To reduce the number of entity-based inclusivity items for operational purposes, we first tested the internal reliability of the two items for each specific nonhuman entity listed in the two matrices (e.g., harm and value items pertaining to a dog, harm and value

¹⁶ An analytical procedure that required respondents to actively exclude (rather than simply not include) certain sets created worldviews with small or zero counts, yielding inadequate statistical power for analysis.

items pertaining to a bald eagle, etc.). Reliability scores were generally acceptable ($\alpha = 0.64$ to 0.79), so we averaged the two scores for each entity, producing 13 harm/value composites (five animals, four vegetative organisms, and four collectives). Because the four specific human entities were presented only in the harm matrix, we could not create human composites.

To assess the extent to which respondents demonstrated internal consistency in the inclusion (or not) of specific animals, we used repeated measures analysis of variance (ANOVA), with worldview affiliation as a between-subjects factor and specific animal as a within-subjects factor. Respondents' scores on the harm/value composites for the five specific animals were the response variables. The analysis estimated mean scores for each specific animal overall and for each worldview overall, and also tested for a significant interaction between specific animal and worldview, which would suggest specific animals' scores differed between worldviews. Finding a significant (entity * worldview) interaction, we used simple effects analysis to estimate mean scores for each specific animal separately by worldview.

We repeated this procedure three more times to assess the extent to which respondents demonstrated internal consistency in the inclusion of each of the other three types of specific entities, using first the harm/value composites for the four specific vegetative organisms; then the harm/value composites for the four specific collectives; and finally the four specific human harm items, as response variables. We separated specific entities in this way (by type) to keep assessments manageable.

Using estimated means as indicators of categorical inclusion, exclusion, or non-inclusion (as specified above), we assessed whether respondents met the following criteria for internal consistency: anthropocentrists include all specific humans and do not include any specific animals, vegetative organisms, or collectives; zoocentrists include all specific humans and animals, but do not include any specific vegetative organisms or collectives; biocentrists include all specific humans, animals, and vegetative organisms but exclude specific collectives; and ecocentrists include all specific humans, animals, vegetative organisms, and collectives.

Repeated measures ANOVA was also used to test for statistically significant differences in mean entity-based inclusivity scores between entities overall and between worldviews overall. Simple effects analyses estimated differences both between entities within each worldview and between worldviews for each specific entity. Differences were estimated using Bonferroni-adjusted pairwise comparisons to correct for familywise error. We explored these results, treating entity-based inclusivity as a continuous variable, and we report on notable findings below.

Results

In our sample, 94 respondents were classified as anthropocentrists (7.1%), 112 as zoocentrists (8.4%), 30 as biocentrists (2.3%), and 427 as ecocentrists (32.1%). The four accretive worldviews cumulatively accounted for 49.8 percent of the sample. Additional descriptive information about the sample is in Appendix C, Table C.1.

Because roughly half of the sample was not affiliated with one of the four accretive worldviews, we assessed whether the criterion-based inclusivity measures could be used to affiliate additional respondents with one of the two non-accretive worldviews mentioned above: misanthropy (scores below five on both human items and five or above on at least one of the composites) and eco-fascism (scores five or above on both human items and the collective composite, and below five on the animal and plant composites). 13 respondents (1%) were classified as misanthropes, and 60 (4.5%) as eco-fascists. Based on visual assessment and summary statistics of criterion-based entity scores from the remaining respondents, we created an analytical procedure representing a third non-accretive worldview that is not discussed in the environmental ethics literature, which includes humans, animals, and collectives (i.e., scores of five or above on both human items and animal and collective composites) and excludes plants (i.e., scores below five on the plant composite). 402 respondents (30.2%) were affiliated with this “atheoretical” worldview.

Respondents affiliated with the four accretive worldviews demonstrated internal consistency with regard to specific humans, i.e., inclusivity scores for all four specific human entities were above five among respondents affiliated with all four worldviews

(Table 2.2). However, they demonstrated several inconsistencies in the inclusion (or not) of specific nonhuman entities (Figure 3.1 and Table 2.2). Anthropocentrists would not have included any specific animals if they were internally consistent, yet they included one specific animal (dog).¹⁷ Zoocentrists would have included all specific animals and no specific collectives if they were internally consistent, but they excluded one specific animal (fly) and included three specific collectives (endangered elephant species, rainforest, and agricultural ecosystem). Biocentrists would have included all specific animals and vegetative organisms if they were internally consistent, but they did not include three specific animals (bald eagle, cow, cougar) and one vegetative organism (oak tree); and actively excluded one animal (fly) and three vegetative organisms (houseplant, fungus, poison ivy). Finally, ecocentrists would have included all specific animals, vegetative organisms, and collectives if they were internally consistent, yet they did not include one specific animal (fly) and one specific vegetative organism (fungus); and actively excluded one specific vegetative organism (poison ivy plant) and one specific collective (local species of mosquito).

Within each worldview, mean entity-based inclusivity scores varied considerably between entities of any one type (Table 2.2). Of particular interest were scores for three specific nonhuman entities (fly, poison ivy, local mosquito species), which were significantly lower than scores for other entities of their types (animals, vegetative organisms, and collectives, respectively) among respondents affiliated with all four worldviews. For zoocentrists, biocentrists, and ecocentrists a fungus also on average received significantly lower scores than both a houseplant and an oak tree.

Some noteworthy differences between worldviews emerged as well (Table 2.2). Philosophical prescription suggests people should hold certain beliefs, but does not specify how deeply or with what degree of conviction those beliefs should be held. As such, from extensionist theory we would not necessarily expect to observe patterned variability in belief strength between people affiliated with different worldviews. However, for nearly all of the specific entities – human and nonhuman – mean entity-

¹⁷ In addition, inclusivity scores for a bald eagle were statistically indistinguishable from a dog among anthropocentrists, even though the estimate for a bald eagle fell just below our cutoff value for inclusion.

based inclusivity scores were significantly higher among ecocentrists than respondents affiliated with any other worldview. Only for a mosquito species were mean scores among ecocentrists statistically equivalent to scores from respondents affiliated with another worldview (biocentrists). Zoocentrists reported higher scores than anthropocentrists for most nonhuman entities (animal, vegetative, and collective), although differences between zoocentrists and anthropocentrists were statistically insignificant for a fly, fungus, poison ivy, and mosquito species. Biocentrists, on the other hand, did not on average report higher scores than respondents affiliated with the two theoretically less inclusive worldviews for any specific nonhuman entities. Biocentrists' scores were statistically equivalent to anthropocentrists' scores for a bald eagle, cougar, fungus, poison ivy, elephant species, and rainforest ecosystem; statistically equivalent to zoocentrists' scores for a houseplant, mosquito species, and agricultural ecosystem; and statistically equivalent to both anthropocentrists' and zoocentrists' scores for a dog, cow, fly, and oak tree.

Discussion

Applying *a priori* analytical specifications to criterion-based inclusivity measures, approximately half our sample could be affiliated with one of the four accretive worldviews. In other words, these respondents professed patterns of belief compatible with extensionist reasoning, which prescribes the bounds of the moral community by consistently applying some operative criterion of intrinsic value. However, if extensionist reasoning explained these respondents' professed patterns of belief, on the same grounds of consistency they should have also included all (and only) the specific entities meeting their operative criterion of intrinsic value. Although in some ways respondents demonstrated such internal consistency, in some ways they did not. Our results suggest extensionist criterion-based logic does not explain which specific elements of biodiversity respondents included in their moral communities, or why. Next we discuss key cognitive, perceptual, and motivational processes that may better explain our results.

This work is exploratory and our study was not designed to test mechanisms. In the discussion that follows we offer plausible interpretations of our data and hypotheses inspired by our results.

Categorization

Psychological research on categorization may explain how respondents could include a set of entities (according to criterion-based inclusivity measures) without including all members of that set (according to entity-based inclusivity measures). Categorization is a basic mental process that allows humans to organize their environment. Categories reflect perceived breaks in the physical world, but they are also defined at different levels of abstraction (Rosch, 1998). Categories at the so-called “basic” level of abstraction occupy a pre-eminent position in human cognition (Rosch, 1998). For example, people most readily identify entities at the basic level; children first learn to name entities at the basic level; and we name more descriptive attributes for entities categorized at the basic level, whereas relatively few attributes are named at higher levels of abstraction (Rosch et al., 1976a; Rosch 1998).

Researchers have suggested categorized objects fall along a spectrum of typicality (McCloskey and Glucksberg, 1978; Mervis and Rosch, 1981). For example, McCloskey and Glucksberg (1978) reported that tadpoles and spiders are perceived as less typical “animals” than dogs and horses. Typicality has cognitive, perceptual, and evaluative implications as well. Rosch et al. (1976b) demonstrated that people prompted with a category will first name members that are most typical of the category. More typical category members are perceived as more attractive than less typical category members, and attractiveness is strongly, positively correlated with positive affect (i.e., emotion) and likeability (Halberstadt, 2006).

The proxies named in criterion-based inclusivity items corresponded to relatively abstract categories (e.g., “plant”). Based on the research above, we would expect these categories to elicit prototypical, generally likeable mental representations associated with few descriptive attributes. Subsequently presented with a less abstract, perhaps even basic category (e.g., “a poison ivy plant”), a different mental representation with a larger

number of attributes would likely come to mind. In this way “plant” and “poison ivy” could have been dissociated, i.e., perceived as entirely separate rather than nested or otherwise related categories. Respondents thus could have included “plants” but excluded “a poison ivy plant,” for example, because each elicited a different mental representation with a different salient set of attributes that, potentially, yielded a different judgment of moral standing.

If the salient attributes informing judgments of moral standing differ, clearly they are not the same. This is incompatible with extensionist reasoning, according to which just one attribute should be salient to all judgments of direct moral standing, *viz.*, whether an entity meets the morally relevant criterion of intrinsic value. Indeed, if one criterion is the primary basis for judgments of direct moral standing, all entities meeting that criterion should be categorically associated with one another (i.e., by the criterion) when judgments of direct moral standing are made. Our results suggest no such categorical associations, either between criterion-based proxies and specific entities (e.g., between “species” and “local species of mosquito”); or between specific entities of a type (e.g., between “local species of mosquito” and “endangered elephant species”). This leads us to hypothesize that the moral inclusion (or not) of specific elements of biodiversity is not explained primarily by extensionist criterion-based logic. But if the consistent application of some extensionist criterion does not explain why one’s moral community includes some specific entities and not others, what might?

Perceptual effects

Commensurate with extensionist theory, psychological research suggests an entity’s inclusion in or exclusion from the moral community is likely to depend, at least in part, on the person’s perceptions of that entity. For an extensionist, the relevant perception is (or, more accurately, should be) whether an entity meets the operative criterion for intrinsic value. On this account the constitution of the moral community should vary categorically between people, according to their different criteria of intrinsic value. Psychologically speaking, though, there is no reason to believe different people would acknowledge different criteria. Rather, research suggests certain perceptions of

nonhuman entities are broadly salient to judgments of moral standing; in particular, perceived similarity with humans and perceived entitativity (explained below). Based on observations discussed next, we suggest our results are more consistent with the latter psychological account.

Perceived similarity

Research on human-animal relations suggests the perceived similarity of nonhuman animals is based on a number of factors, including their perceived phylogenetic relatedness or physical resemblance to humans, their behaviors in context, and the degree to which they are familiar or attached to humans (Eddy and Gallup, 1993; Mitchell and Hamm, 1997; Harrison and Hall, 2010). Animals perceived as relatively similar to humans along one or more of these dimensions are often perceived to have higher mental capacities, including agency, experience, intention, and/or intelligence (Eddy and Gallup, 1993; Urquiza-Haas and Kotrschal, 2015); and these animals, in turn, are more likely to be granted direct moral standing, or at least afforded basic moral concern (Gray et al., 2007; Bastian et al., 2012b; Piazza and Loughnan, 2016).

Our results corroborate with this research. For instance, respondents affiliated with all four worldviews included a dog. As reported by Eddy and Gallup (1993), dogs are perceived as highly similar to humans in terms of their mental capacities, second only to apes among nonhuman animals. Eagles, cows, and cheetahs are also perceived as moderately similar to humans (Eddy and Gallup, 1993), perhaps explaining why a bald eagle, cow, and cougar (analogous to a cheetah) were included by zoocentrists and ecocentrists; and at the high end of non-inclusion, rather than actively excluded, among anthropocentrists and biocentrists. Flies, meanwhile, are perhaps comparable to a worm or a cockroach, which are perceived to be low in mental capacities and highly dissimilar to humans (Eddy and Gallup, 1993). In our sample flies were either not included or actively excluded by respondents affiliated with all four worldviews.

In distinction, research suggests plants and other sedentary, vegetative organisms may more readily be perceived as inanimate objects than living beings (Santi et al., 2015); and, as perceived inanimate objects, they are not likely to be attributed intentional

states (Urquiza-Haas and Kotrschal, 2015). Although we are unaware of research explicitly investigating the relationship between the perceived mental capacities of non-human, non-animal organisms and their moral standing, based on research cited above we would hypothesize that, if plants are not attributed intentional states or other mental qualities, they are not likely to be included in the moral community. And indeed, with rare exceptions respondents affiliated with all four worldviews excluded or did not include the four specific vegetative organisms. (Ecocentrists included an oak tree and a houseplant, a result we discuss below.)

Perceived entitativity

Like specific animals and vegetative organisms, the inclusion (or not) of specific species and ecosystems appeared to transcend worldview affiliations. Not only ecocentrists but also zoocentrists included an endangered elephant species, a rainforest ecosystem, and an agricultural ecosystem; while anthropocentrists and biocentrists indicated non-inclusion (rather than active exclusion) of these entities. And yet, perceived similarity does not obviously explain why respondents included (or not) these specific entities, which at least at face value seem categorically dissimilar from humans. We cannot rule out the possibility that respondents conceptualized collectives in terms of their individual, mentally endowed constituents (e.g., individual elephants, rather than an elephant species). But it is also possible that perceived similarity does not primarily influence judgments of moral standing for specific nonhuman collectives.

Alternatively, specific ecological collectives may have been granted moral standing because they were perceived as cohesive entities. Psychologically this is called entitativity, the perception that a collection of individuals is an integrated unit, or “entity,” rather than an aggregate of individuals (Campbell, 1958; Smith et al., 2013). As perceived entities, specific collectives may have been attributed quasi-intentional states, analogous to the ecocentric extensionist criterion of “interests” (see Effron and Knowles, 2015). But perceived entitativity is also and more simply analogous to non-extensionist ecocentric theories, which justify the moral standing of collectives not by drawing some equivalency between species or ecosystems and humans, but rather by defending their

holistic value as collectives, *per se*. Callicott (1989), for example, argues for the intrinsic value of collectives as interconnected biotic communities. McCord (2012) and White (2013) highlight evolutionary continuity as grounds for the intrinsic value of species. If the perceived entitativity of species and ecosystems reflects recognition that collectives possess these or other holistic values (a hypothesis that merits testing in future research), it would seem perceived entitativity is both psychologically (i.e., descriptively) salient and ethically (i.e., prescriptively) defensible as a basis for the direct moral standing of ecological collectives.

However, the hypothesis that respondents included species based on their perceived entitativity seems at odds with respondents' unilateral exclusion of a local mosquito species. Researchers have found the perceived potential for harm or conflict (Opotow, 1993; Piazza et al., 2014) and (dis)utility (Opotow, 1993; Hills, 1995; Serpell, 2004) also inform the moral status of nonhuman animals. As such, it is not surprising that a mosquito species, likely to be perceived as both harmful and low in utility, would be overwhelmingly denied moral standing. Indeed, negative stereotypes of mosquitoes may even have been amplified by their perceived entitativity (Spencer-Rodgers et al., 2007). Also, as discussed in the next section, a phenomenon called motivated reasoning may complement these perceptual effects to explain why a mosquito species was so widely excluded from the moral community in our sample.

Motivated reasoning

From a philosophical perspective, rational agents should arrive at a sound conclusion regarding the moral standing of any entity by an impartial deliberative process. Psychologically speaking, however, reasoning does not always involve impartial weighing of evidence and disinterested evaluation of argument quality (e.g., Edwards and Smith, 1996). Reasoning can also be used to reach desirable conclusions. This phenomenon, called "motivated reasoning," occurs when individuals are "motivated" to process information in ways that protect important beliefs or allow them to achieve certain goals (Kunda, 1990). US lifestyles in many ways rely upon the routine harm and often exploitation of nonhuman entities (Plous, 1993). Rather than challenging or

violating social norms, it may be easier to strategically (if sub-consciously) avoid holding beliefs that would cause internal conflict, or “dissonance,” e.g., by denying the direct moral standing of certain nonhuman entities. Piazza and Loughnan, for example, show people are motivated to deny the mental capacities (and therefore moral standing) of animals they plan to consume, even against information about the intelligence of those animals (see also Bastian et al. 2012b; Graça et al. 2016; Piazza and Loughnan 2016).

Respondents affiliated with all four worldviews excluded four specific nonhuman entities, *viz.*, a fly, fungus, poison ivy plant, and local mosquito species.¹⁸ Indeed, mean inclusivity scores for all four were noticeably (and statistically significantly) lower than scores for other entities of their types. Observing that a fly, fungus, poison ivy plant, and mosquito species are all entities humans routinely harm or may have an interest in harming, our results inspire the hypothesis that respondents were motivated to deny the direct moral standing of these entities. Considering the research cited above (Bastian et al., 2012b), it is interesting that cows were not actively excluded from the moral community by respondents affiliated with any of the four worldviews. This may reflect the survey context, which simply presented a cow as one animal among others. Respondents may have experienced a stronger motivation to exclude cows if the survey had more explicitly associated cows with beef or food (see Bratanova et al., 2011).

Motivated reasoning serves not only to reduce internal dissonance, but also to protect values and beliefs that are integral to personal or social identity (Uhlmann et al., 2009; Hart and Nisbet, 2012). In this capacity, motivated reasoning may explain why ecocentrists included a houseplant and an oak tree. For nearly every specific nonhuman entity, ecocentrists reported stronger inclusivity beliefs (i.e., significantly higher scores) than respondents affiliated with other worldviews (see below for further discussion). Although, as noted above, we cannot precisely interpret belief strength, our results are at least consistent with the hypothesis that ecocentrists reported stronger beliefs because inclusivity is central to their sense of self (Krosnick et al., 1993). If so, they may have been motivated to include all specific nonhuman entities, even those less readily

¹⁸ The two exceptions (a fly and a fungus among ecocentrists) still were on average rated only at the low end of non-inclusion.

perceived as similar to humans, except where inclusion would create excessive dissonance. Understanding whether and how motivated reasoning influences both the exclusion and the inclusion of specific nonhuman entities is an important avenue for future research.

The strength and scope of inclusivity

As shown in Figure 3.1, respondents' extensionist worldview affiliations did not reliably predict whether their moral communities included (or not) specific nonhuman entities. However, respondents affiliated with relatively more inclusive worldviews did generally have higher mean inclusivity scores for any specific nonhuman entity than respondents affiliated with comparatively less inclusive worldviews (Table 3.2). This inspires the hypothesis that variability between respondents may better be understood as a gradient in the overall strength of their inclusivity beliefs, rather than a categorical distinction in which criterion-based set of entities they include their moral communities.

Biocentrists are a notable exception to the hypothesized gradient, being indistinguishable from anthropocentrists and/or zoocentrists in inclusivity scores for all specific nonhuman entities (Table 3.2). The deviation from an otherwise pronounced trend, paired with the relatively small number of biocentric respondents ($n = 30$), leads us to suggest the prescriptive worldview "biocentrism" may not map onto a descriptively significant pattern of belief. This hypothesis should be tested in future studies.

On the other hand, people affiliated with an atheoretical worldview (i.e., who included humans, animals, and collectives, but not plants) fell neatly along the proposed gradient of increasing entity-based inclusivity scores, intermediate between zoocentrists and ecocentrists (Appendix C, Table C.2).¹⁹ Substituting this atheoretical worldview for biocentrism in a sequence of increasingly inclusive worldviews gives rise to the hypothesis that the proposed gradient of belief strength is related to the scope of respondents' moral communities, as differentiated by worldview affiliations, such that inclusivity beliefs are stronger among zoocentrists than anthropocentrists; among

¹⁹ Defending or disputing the rational grounds for this worldview may be an important horizon for future scholarship in environmental ethics if, as our results suggest, it represents an empirically significant pattern of belief.

atheorists than zoocentrists; and among ecocentrists than atheorists. This relationship may also explain why we observed so much internal consistency among our respondents. For example, zoocentrists and ecocentrists included a bald eagle, while anthropocentrists did not. This can be interpreted as variability along a continuum of belief strength, which happened to correspond to categorical shifts from non-inclusion to inclusion according to our analytical specifications.

We cannot comment here on possible mechanisms for this relationship, or the direction of influence. However, our results do suggest that the proposed relationship between the scope of the moral community and the strength of inclusivity beliefs may crosscut perceptual effects and motivational processes. For example, both anthropocentrists and ecocentrists included a dog, a result we interpreted in terms of a dog's perceived similarity with humans; but ecocentrists rated a dog significantly higher than anthropocentrists. Conversely, anthropocentrists and ecocentrists both excluded a mosquito species, a result we interpreted as a partially motivated process; but ecocentrists again rated a mosquito species significantly higher than anthropocentrists.

The relationship we hypothesize also potentially bridges prescriptive theory with practical applications in conservation. Our results suggest the possibility that people who can be persuaded to hold beliefs that align with ethically defensible patterns of belief, e.g., zoocentrism or ecocentrism, may also believe more strongly that specific elements of biodiversity are members of the moral community. It is reasonable to hypothesize that inclusivity belief strength is associated with the strength of other values, beliefs, and attitudes, which may in turn inform intentions or behaviors that are pertinent to biodiversity conservation (see Crimston et al., 2016).

Other worldviews

In line with our objectives, the discussion above focused primarily on the four accretive extensionist worldviews. Before concluding, it is worth commenting briefly on the relatively small number of respondents affiliated with the two other non-accretive worldviews discussed by environmental ethicists, *viz.*, misanthropy and eco-fascism. Although our sample is not representative, our results provide suggestive evidence that

relatively few people profess beliefs that map onto these two worldviews. From a practical conservation perspective, we highlight two potentially important implications.

First, although current scholarship advocates a fluid integration of conservation with humanitarian objectives such as economic development and social justice (Kareiva and Marvier, 2012; Shoreman-Ouimet and Kopnina, 2015), historically conservation has been maligned for misanthropically elevating the protection of nature above the welfare of humans (Adams et al., 2004). Our results suggest this is not a necessary tradeoff, in the sense that admitting some elements of biodiversity into the moral community does not signify the concomitant expulsion of humans. At least at the level of professed belief, our results suggest people readily accommodate humans and nonhumans in their moral communities (although we cannot comment on how or whether professed beliefs inform behaviors and tradeoffs in practical contexts).

Second, while biodiversity is broadly defined to include life at all levels of organization (United Nations, 1992), in practice protecting collective entities such as species, populations, and ecosystems tends to be prioritized over or even at the expense of individual organisms (Wallach et al., 2018). Some suggest such tradeoffs are necessary to achieve larger conservation objectives (e.g., Di Minin et al., 2016), although it remains unclear whether or under what circumstances this is the case. Regardless, our results suggest efforts to protect collectives without compromising the welfare of individual organisms may better align with social values and beliefs than conservation initiatives categorically elevating the persistence of the collective over the welfare of the individual (see also Bruskotter et al., 2017).

Conclusions

Conservationists seek to protect the diversity of life on Earth. Although some environmental ethicists suggest this can be achieved within an anthropocentric paradigm (e.g., Norton, 1991), others have suggested an ethical paradigm shift is a necessary (if not necessarily sufficient) condition for long-term conservation success (e.g., White, 1967;

Routley, 1973; Callicott, 1984). If so, cultivating, proliferating, and/or naturalizing non-anthropocentric beliefs may be integral to the work of conservation.

In the short term this agenda may best be served by highlighting that nonhuman organisms possess certain qualities that research suggests are psychologically salient to the moral standing of nonhuman entities; their ability to think, feel, and/or experience, for example. Though perhaps largely motivated by practical considerations, zoocentric theory gives us good reason to believe such qualities are an ethically defensible basis for direct moral standing as well. Further, there is no reason to believe sentience- or subjectivity-based arguments need be restricted to nonhuman animals. Research suggests plant and invertebrate organisms, which are critical elements of global biodiversity that nonetheless receive relatively scant conservation attention (Cardoso et al., 2011; Negrón-Ortiz et al., 2014), may also share some of these qualities (Gorzelak et al., 2015; Trewavas, 2016). Species, ecosystems, and other ecological collectives, on the other hand, may most readily be admitted to the moral community if people are encouraged to recognize their holistic qualities, such as interconnectedness, integrity, or homeostasis. Such qualities, again, may be not only psychologically salient but also (according to various ecocentric theories) morally relevant. In general, arguments for moral standing may more effectively be made at a basic level of categorization (e.g., regarding “bees” rather than “animals” or “wildlife”), to ensure prescriptive theories are associated with and applied to specific elements of biodiversity.

Conservation efforts may be particularly challenged, however, when they seek to promote the moral inclusion of those elements of biodiversity people are motivated to exclude, i.e., entities regarded as “pests,” “threats,” or “nuisances.” Motivated reasoning may be particularly problematic for conservationists in contexts experiencing high degrees of human-wildlife conflict (e.g., Manfredo and Dayer, 2004), or where harm of nonhuman entities has become naturalized as a normal and inevitable component of management or conservation strategies (e.g., Russell et al., 2016; Batavia et al., 2018b). Arguably if we become aware of our biases we can more effectively manage them (Kahan, 2013). If people are acquainted with the arguments establishing rational grounds for the intrinsic value of nonhuman entities, it may be more difficult to deny or disregard

that value in specific settings and decision contexts. In this way, broader social fluency in environmental ethics may also counteract motivated reasoning. We offer this as a testable hypothesis and an important direction for future research.

However, we do not mean to suggest the ethical underpinnings of conservation should be dictated entirely by psychological or pragmatic considerations. Ethics, as an intellectual pursuit, is not beholden to the state of the world, or humans within it; “is” does not imply “ought,” after all (Callicott, 1989). As conservationists and moral agents we have an enduring interest in arranging our beliefs and behaviors appropriately with regard to Earth and its biodiversity. In this sense, prescriptive theory is critical to the work of conservation. From an ethical perspective there is good reason to believe humans have direct moral obligations to biodiversity at all levels of organization (Rolston, 2012). Even if we are not psychologically predisposed to acknowledge and honor these obligations, as Barkow (1978) points out, psychological dispositions render certain patterns of belief or behavior easy, but not necessarily inevitable. Humans also have extraordinary capacities for learning and adaptation. Environment ethics may have an important role to play as part of a broader process of social transformation, gradually shifting the cultural and moral narratives, and in turn the values and beliefs, surrounding biodiversity and its conservation (Haidt, 2007; Manfredi et al., 2016).

At the same time, a prescriptive ethic detached from the constraints and propensities of human psychology is at best pedantic, and at worst inoperable. We therefore recommend ongoing efforts to integrate normative theory in environmental ethics with empirical research in psychology and other social sciences. An empirically informed conservation ethic that is both philosophically sound and practicable as a framework for human conduct could be a powerful ally in efforts to conserve biodiversity.

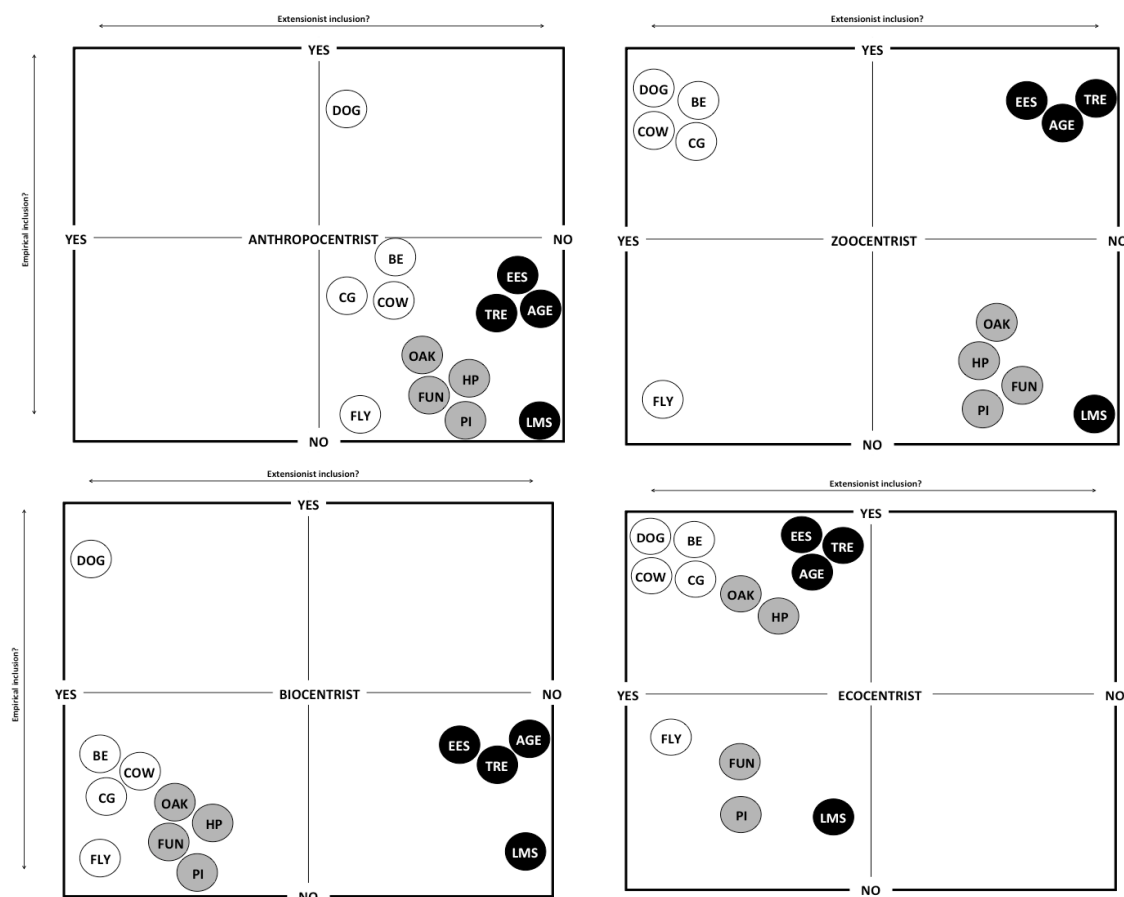


Figure 3.1 Internal (in)consistencies among anthropocentrists, zoocentrists, biocentrists, and ecocentrists, based on means estimated by repeated measures analysis of variance (ANOVA). Each specific nonhuman entity is plotted in the quadrant corresponding to whether it should be included in the moral community, according to extensionist prescriptions (left quadrants yes, right quadrants no); and whether it was actually included in the moral community, according to our empirical data (top quadrants yes, bottom quadrants no). The top left and bottom right quadrants represent internal consistency. Within each quadrant entities are grouped by type horizontally, with animals on the left, vegetative organisms center, and collectives right. Higher vertical placement within quadrant represents a relatively higher harm/value composite score, but vertical placement is not precisely scaled to estimated means. Animals (white): DOG = dog, BE = bald eagle, COW = cow, CG = cougar, FLY = fly. Vegetative organisms (grey): OAK = oak tree, HP = houseplant, FUN = fungus, PI = poison ivy plant. Collectives (black): EES = endangered elephant species, LMS = local mosquito species, TRE = tropical rainforest ecosystem, AGE = agricultural ecosystem.

Table 3.1 Breakdown of respondents affiliated with anthropocentrism, zoocentrism, biocentrism, and ecocentrism. Composites of criterion-based inclusivity items (shown on the left) were created for animals, plants, and collectives. Items marked (R) were reverse coded for analysis. These composites, along with two individual human items, were used to affiliate respondents with one of the four worldviews based on specifications shown in the top line of each populated cell on the right. The bottom line of each populated cell on the right shows the mean and standard deviation (M, s.d.) for each item or composite, by worldview.

	Anthropocentric n = 94	Zoocentric n = 112	Biocentric n = 30	Ecocentric n = 427
Humans (Cronbach's $\alpha = 0.50$)				
Every person has value above and beyond his or her usefulness for others.	≥ 5 5.84, 0.85	≥ 5 5.96, 0.81	≥ 5 5.97, 0.85	≥ 5 (6.33, 0.77)
As a basic principle, people ought to demonstrate respect for other individual people.	≥ 5 (6.29, 0.67)	≥ 5 (6.41, 0.73)	≥ 5 (6.30, 0.75)	≥ 5 (6.82, 0.46)
Animals (Cronbach's $\alpha = 0.81$)				
The wellbeing of an individual animal matters, even if it does not affect the wellbeing of people.	< 5 (3.72, 0.83)	≥ 5 (5.76, 0.75)	≥ 5 (5.97, 0.74)	≥ 5 (6.52, 0.62)
Every individual animal possesses a dignity that deserves respect.				
Plants (Cronbach's $\alpha = 0.71$)				
The wellbeing of individual plants is not a matter of moral concern to me. (R)	< 5 (2.73, 1.15)	< 5 (3.56, 0.90)	≥ 5 (5.38, 0.50)	≥ 5 (6.04, 0.76)
Every plant deserves respect as a living creature.				
Collectives – species/ecosystems (Cronbach's $\alpha = 0.88$)				
People have a moral obligation to consider how their decisions might harm or benefit a species, even if the species has no apparent use.	< 5 (3.96, 0.87)	< 5 (4.35, 0.61)	< 5 (4.55, 0.28)	≥ 5 (6.46, 0.58)
It makes no sense to talk about respecting a species. (R)				
When people cause the extinction of a species, they have committed a moral wrong against the species.				
People have a moral obligation to consider how their decisions might harm or benefit an ecosystem, even if the ecosystem has no apparent use.				
It makes no sense to talk about respecting an ecosystem. (R)				
When people cause the loss of an ecosystem, they have committed a moral wrong against the ecosystem.				

Table 3.2 Results of repeated measures analysis of variance (ANOVA), separated by type of specific entity (animal, vegetative organism, collective, or human). Worldview affiliation is a between-subjects factor and specific entity is a within-subjects factor. Scores on entity-based inclusivity harm/value composites (for animals, vegetative organisms, and collectives) or harm items (for humans) are the response variables. Mauchly's test indicated non-sphericity in all four analyses, so reported F-values use the Greenhouse-Geisser correction. Different superscript letters (horizontally) indicate estimated means differ significantly between worldviews ($p < 0.05$), and different superscript numbers (vertically) indicate estimated means differ significantly between entities of a type.

		Anthropocentric	Zoocentric	Biocentric	Ecocentric	F _{between}	η^2 _{between}
Animals	Overall	4.17 (0.09) ^a	4.81 (0.08) ^b	4.47 (0.16) ^{a,b}	5.89 (0.04) ^c	135.55	0.38
<i>Dog</i>	5.64 (0.05) ¹	5.06 (0.10) ^{a/1}	5.71 (0.09) ^{b/1}	5.28 (0.17) ^{a,b/1}	6.52 (0.05) ^{c/1}		0.28
<i>Bald eagle</i>	5.46 (0.06) ²	4.94 (0.10) ^{a/1}	5.54 (0.09) ^{b/2}	4.88 (0.18) ^{a/2}	6.48 (0.05) ^{c/1}		0.30
<i>Cow</i>	5.10 (0.07) ³	4.37 (0.12) ^{a/2}	5.09 (0.11) ^{b/3}	4.77 (0.21) ^{a,b/2,3}	6.18 (0.06) ^{c/2}		0.28
<i>Cougar</i>	5.01 (0.07) ³	4.32 (0.12) ^{a/2}	5.07 (0.11) ^{b/3}	4.43 (0.21) ^{a/3}	6.21 (0.06) ^{c/2}		0.30
<i>Fly</i>	2.97 (0.10) ⁴	2.15 (0.17) ^{a/3}	2.66 (0.16) ^{a/4}	3.00 (0.31) ^{a/4}	4.08 (0.08) ^{b/3}		0.18
F _{within}	384.17						
η^2 _{within}	0.37	0.27	0.31	0.08	0.53		
Vegetative organisms	Overall	2.67 (0.13) ^a	3.14 (0.12) ^b	3.37 (0.23) ^b	4.78 (0.06) ^c	109.73	0.33
<i>Houseplant</i>	3.83 (0.08) ¹	2.75 (0.15) ^{a/1}	3.47 (0.13) ^{b/1}	3.73 (0.26) ^{b/1}	5.38 (0.07) ^{c/1}		0.36
<i>Oak</i>	4.49 (0.07) ²	3.56 (0.13) ^{a/2}	4.21 (0.12) ^{b/2}	4.13 (0.22) ^{a,b/1}	6.04 (0.06) ^{c/2}		0.42
<i>Fungus</i>	3.08 (0.10) ³	2.40 (0.18) ^{a/1}	2.75 (0.16) ^{a/3}	2.98 (0.31) ^{a/2}	4.18 (0.08) ^{b/3}		0.16
<i>Poison ivy</i>	2.56 (0.10) ⁴	1.95 (0.18) ^{a/3}	2.14 (0.17) ^{a/4}	2.63 (0.32) ^{a/2}	3.51 (0.08) ^{b/4}		0.13
F _{within}	192.90						
η^2 _{within}	0.23	0.12	0.19	0.03	0.56		
Collectives	Overall	4.02 (0.09) ^a	4.52 (0.08) ^b	4.23 (0.16) ^{a,b}	5.74 (0.04) ^c	143.48	0.40
<i>Elephant species</i>	5.38 (0.06) ¹	4.89 (0.11) ^{a/1}	5.41 (0.10) ^{b/1}	4.72 (0.19) ^{a/1}	6.50 (0.05) ^{c/1,2}		0.31
<i>Mosquito species</i>	2.59 (0.11) ²	1.87 (0.18) ^{a/2}	2.15 (0.17) ^{a,b/2}	2.87 (0.33) ^{b,c/2}	3.50 (0.09) ^{c/3}		0.13
<i>Rainforest ecosystem</i>	5.28 (0.06) ¹	4.66 (0.11) ^{a/3}	5.30 (0.10) ^{b/1}	4.65 (0.19) ^{a/1}	6.52 (0.05) ^{c/1}		0.35
<i>Agricultural ecosystem</i>	5.26 (0.06) ¹	4.66 (0.11) ^{a/1,3}	5.24 (0.10) ^{b/1}	4.68 (0.20) ^{a,b/1}	6.46 (0.05) ^{c/2}		0.32
F _{within}	472.50						
η^2 _{within}	0.42	0.25	0.32	0.04	0.61		
Humans	Overall	6.11 (0.11) ^a	6.09 (0.10) ^a	5.69 (0.19) ^a	6.52 (0.05) ^b	12.08	0.05
<i>Myself</i>	6.07 (0.08) ^{1,2}	5.97 (0.13) ^{a/1,3}	6.12 (0.12) ^{a,b/1,2,3}	5.77 (0.24) ^{a/1,2}	6.43 (0.06) ^{b/1,2}		0.03
<i>My family</i>	6.31 (0.06) ³	6.39 (0.11) ^{a,b/2}	6.29 (0.10) ^{a/1}	5.90 (0.19) ^{a/1}	6.67 (0.05) ^{b/3}		0.04
<i>Americans</i>	6.14 (0.07) ¹	6.15 (0.12) ^{a/1}	6.12 (0.11) ^{a/2}	5.73 (0.20) ^{a/1}	6.55 (0.05) ^{b/1}		0.05
<i>People in other country</i>	5.89 (0.07) ²	5.94 (0.13) ^{a/3}	5.84 (0.12) ^{a/3}	5.37 (0.23) ^{a/2}	6.43 (0.06) ^{b/2}		0.06
F _{within}	20.80						
η^2 _{within}	0.03	0.06	0.04	0.02	0.08		

GENERAL CONCLUSION

I tend to be most intrigued by ideas that push against the limits of human knowledge; things like mystery, paradox, death, and God. For this reason, perhaps, I tend to have trouble moving past contingent understandings, uncertainty, or even doubt, especially on questions of metaphysics or morality. In my mind, presuming to possess “knowledge” of such matters signifies a combination of arrogance and hubris that I find highly distasteful, and deeply problematic when used to legitimate one’s own claims to power. Anthropocentrism is a particularly irksome expression of this logic (Warren, 1990).

So when I first learned about new conservation in 2014, it felt like a personal affront. The capitulation to people’s (assumed) anthropocentric leanings seemed nothing short of betrayal, and a sign of moral defeat. Thus, I formed the dubious aspiration to “prove them wrong.” In other works I made the case that anthropocentrism is an inappropriate ethical foundation for conservation (Batavia and Nelson, 2016, 2017). I wanted to test whether (and hoped to show that) it was an ineffective one as well. Fortunately the vendetta gave way to more measured inquiry and circumspection, as my own assumptions were gradually challenged and de-stabilized. The relationship between ethical beliefs and behavior was one I had taken for granted, and was therefore surprised to find myself questioning as I wrote the paper appearing above as Chapter One. What had begun as a targeted effort to debunk the myths of new conservation started to morph into a larger meditation on morality and human nature. But this, of course, is the work of a lifetime.

To write a “Conclusion” is a formal requirement of this dissertation, but I fear the word itself is a misnomer. I have contemplations, conjectures, and a great many questions, but no conclusions. To bring the work to a close, however, I will summarize key findings and implications from each of the chapters, and also highlight some directions for future research. I end with thoughts on significance.

Key findings and implications

The philosophical work of ethics is to understand how humans ought to conduct themselves, and is achieved by engaging in processes of rational reflection and discourse. Using empirical methods it is possible to quantify whether or the extent to which people's professed values and beliefs are consistent with philosophical understanding, and also how or in what ways those professed values and beliefs influence their behaviors. This is the basic approach employed in the three chapters above, each in its own way treating environmental ethics as a human behavioral phenomenon embedded in larger (social, situational, and/or psychological) contexts. Each chapter highlights some of the factors that condition and constrain how our moral commitments influence our conduct (Chapters One and Two), or perhaps shape those commitments in the first place (Chapter Three). The major takeaways of each chapter can be summarized as follows.

Chapter One

In Chapter One, we found that most respondents donated equal amounts of money for human and nonhuman conservation beneficiaries; but among the least inclusive respondents, human beneficiaries actually elicited lower donations on average than nonhuman beneficiaries. Overall, this study suggests messages highlighting the nonhuman beneficiaries of conservation most consistently elicit positive attitudinal and behavioral (i.e., donation) responses. However, results also suggest individuals do not necessarily respond most favorably to messages highlighting conservation beneficiaries they consider to be proper moral patients. Other situational and psychological variables potentially exert stronger influence over behavioral responses than the “value-matching” aspect of conservation outreach messages. Chapter One provides evidence to dispute one of the core claims underpinning new conservation and ecosystem services, *viz.*, that the instrumental values nonhuman nature provides humans more effectively compel people to support conservation than the value nonhuman nature has in itself. Although additional studies are warranted before drawing definitive conclusions, our findings suggest conservationists can no longer assume in good faith that emphasizing “nature for people” is their most effective communication strategy.

Chapter Two

When adopted as part of an individual's moral code, an environmental ethic is contextualized and constrained by a host of social and psychological factors, including social norms, institutions, and structures; emotional processes; situational variables; and competing cognitions. As discussed in Chapter Two, some or all of these factors may amplify or attenuate the degree of influence one's moral commitments exert over one's behavior, including behaviors pertaining to the environment. This chapter highlights the need for systemic transformation to achieve global sustainability. If behaviors are largely constrained by aspects of the broader socio-cultural context, then it behooves conservationists, including scientists and ethicists, to engage widely with citizens, businesses, educators, and political leaders, in efforts to coordinate and effect change across sectors of society.

Chapter Three

As reported in Chapter Three, approximately half of a non-representative sample of Americans could be mapped within one of four prescriptive worldviews discussed in the environmental ethics literature (anthropocentrism, zoocentrism, biocentrism, or ecocentrism). However, respondents' self-reported values and beliefs did not always adhere to standards of rational consistency prescribed by philosophers, suggesting people do not necessarily act as rational moral agents theoretically "should" in valuing specific elements of biodiversity. Instead, certain cognitive, perceptual, and motivational processes may better explain the constitution of respondents' moral communities – both whom they include, and whom they do not. If support for biodiversity conservation rests, even in part, on appropriately valuing nonhuman nature, it is important to understand these drivers and motivations, especially when they engender beliefs that are (arguably) ethically problematic. Even entities that are not readily included in the moral community may provide benefits for humans or other established members of the moral community, and emphasizing these instrumental benefits may generate awareness and support for such entities in the short term. However, conservationists should at the same time make

concerted efforts to build moral concern for all elements of biodiversity not only as goods or services, but also as bearers of intrinsic value.

Directions for future research

Questions and hypotheses for future research were highlighted in chapters above, but a few additional directions for future research presented themselves in preparing this dissertation as a whole.

First, future research should assess whether or the extent to which training in environmental ethics enhances consistency, both within ethical belief systems and between professed ethical beliefs and manifest behaviors. People who understand the philosophical arguments for intrinsic value might not only reflect at greater length on their moral communities, but also internalize their beliefs to a greater degree, perhaps even overriding inherent biases or resisting the motivation to deny moral standing to certain entities. Research suggests judgments of moral standing form, at least in part, by measuring nonhuman entities against basic standards of humanness or human interests (Bastian et al., 2012a; Piazza et al., 2014). It remains unclear whether or how these basic aspects of our psychology are malleable to active and intentional revision, e.g., through training in environmental ethics.

Moral inclusivity warrants additional interdisciplinary study, and particularly studies integrating empirical research in psychology with philosophical scholarship on environmental ethics. For example, researchers might investigate whether or in what ways the constitution of the moral community differs when moral obligations are rooted in care, as opposed to intrinsic value. Understanding how moral inclusivity relates to behavior is another important direction for future research. Some literature in environmental ethics suggests our moral obligations to different (human and nonhuman) members of the moral community are not homogenous, and perhaps not even static across situations (Goodpaster, 1978; VanDeVeer, 1979; Sterba, 1994). To what extent does such philosophized variability translate into behavioral variability? Future work should also systematically investigate other contextual variables that may qualify judgments of moral standing. For example, if an individual generically includes “a mouse”

in her moral community, would this judgment change if the mouse were presented as a house pest, versus a house pet? Do similar processes explain the inclusion of terrestrial and marine biodiversity? Ideally, in pursuing these and other questions researchers would incorporate qualitative methods to add nuance and descriptive depth to the scientific understanding of the moral community.

Finally, this dissertation raises additional questions about the effectiveness of new conservation and/or ecosystem services approaches. For example, rather than verbal messages, had we described actual conservation initiatives that protected either services for humans (e.g., water supply or recreational opportunities) or habitat for species (i.e., for the species' own sake), how, if at all, would observed attitudinal and behavioral responses have differed from our results? In a local landowner context, where close relatives and community members rather than “people” in the abstract stand to benefit from conservation, would appeals to human beneficiaries be more effective than appeals to nonhuman beneficiaries? To what extent would our findings be replicated using other metrics of support for conservation (e.g., advocacy, volunteerism, or recruitment to professions such as conservation biology)? Future work should also test whether messages highlighting instrumental values are more effective than messages highlighting intrinsic value, in efforts to isolate the effectiveness of anthropocentric appeals, *per se*, from the effectiveness of utilitarian appeals.

Significance

Inconsistency between various types of environmental attitudes and/or beliefs and behaviors is well documented in the social science literature (Weigel and Newman, 1976; Kollmuss and Agyeman, 2001; Steg and Vlek, 2009; Echegaray and Hansstein, 2016; Maxwell-Smith et al., 2018). The unique and overarching importance of this dissertation and similar efforts, I believe, is in its integration of (social) science and environmental ethics – the “is” and the “ought” of conservation. Logically both are required to make sound, justified decisions. However, as illustrated and discussed in chapters above, an “ought” is not required to act, strictly speaking.

For example, every day I have the option to drive or bike to campus. My moral reasoning process might be articulated:

- P1. Commuting to campus by bike is the most environmentally responsible option.
- P2. I should commute by the most environmentally responsible option.
- C. Therefore, I should commute to campus by bike.

And yet, even knowing what I should do (according to the inference above), invariably I do not do it. My moral obligations are overridden by personal convenience, a logical move that replaces the prescriptive “ought” with the far less demanding descriptive, “will”:

- P1. Commuting to campus by car is the most convenient option.
- P2. I will commute to campus by the most convenient option.
- C. Therefore, I will commute to campus by car.

It is important for conservationists to understand both these arguments - the latter for strategic planning, negotiation, and communication; and the former for inspiration, advocacy, and leadership. Separately evaluating the minor premises (P2) of the two syllogisms is the work of conservation ethics and conservation psychology, respectively. However, the objective of this dissertation was to consider these arguments together and measure them against one another, determining whether, to what extent, or under what conditions “should” and “will” are interchangeable as explanations for human behavior. What I have just described is an empirical (scientific) exercise informed by scholarship in the humanities, which in itself is significant as an endeavor in interdisciplinary dialogue. To achieve not just dialogue but synthesis requires a further step. We have brought two disparate things together and learned something from the effort, but what does it mean? To reiterate, I draw no conclusions, but I do have a few thoughts.

I have increasingly come to regard my dissertation as a study of integrity. An ethic is a statement of an ideal, articulating a vision for proper human conduct. Ethics are aspirational and creative. We might even say ethics are dreams. Integrity, I believe, is the realization of the dream. To demonstrate integrity is to act according to our ethics – to

speak “is” and “ought” in the same word, or to enact “should” and “will” in the same deed. Like any philosophical concept the meaning and implications of integrity are contested, but many philosophers believe it has two elements: basic consistency, which can be described empirically; and what we might call rectitude, which is an ethical judgment (Cox et al., 2017). To act with integrity is not just to demonstrate consistency, but to demonstrate consistency with what one believes (or feels) to be good or right – and to have appropriate notions of what those entail. Integrity thus understood is both a descriptive and a normative term, and a virtue in and of itself.

White (1967) believed a flawed worldview is the root cause of environmental destruction, and therefore a new worldview is needed to achieve sustainability. Perhaps what is needed is not a new worldview, *per se*, but integrity in the full descriptive and normative aspects of the word. That is, humans need to form proper notions of how we ought to be; to hold and internalize those notions as individuals; and to arrange our societies in a way that allows us to manifest those notions through our conduct in the world.

In this sense, I am also beginning to think conservation, at its best, is a pursuit for human integrity, which takes on new urgency as scientists herald increasingly dire futures for human and nonhuman life on Earth (Intergovernmental Panel on Climate Change, 2018). In this context of crisis, the conservation community has proposed to focus on protecting ecosystem services, thinking and hoping that doing so will align conservation with the predominant values of global publics, and thereby compel them to align themselves with conservation. The ecosystem services/new conservation strategy is demonstrably misguided on at least two levels; first, that people do not necessarily act as a direct reflection of their ethical beliefs (as shown specifically in Chapter One and discussed generally in Chapter Two); and second, that people’s ethical beliefs are not generally consistent with an anthropocentric worldview (e.g., Vucetich et al., 2015, and corroborated by survey data in Chapters One and Three). However, anthropocentric approaches like ecosystem services or new conservation also represent a collective failure to pursue integrity in human life and society. Even if we were to learn that people are, in fact, largely anthropocentric, a conservation paradigm consistent with such morally

bankrupt values would miss the ethical element of integrity, and the aspirational element of ethics.

Last Thoughts

It seems appropriate to end with William James. James was a psychologist and a philosopher, a quintessential interdisciplinarian whose interests and expertise fluidly integrated the descriptive elements of the sciences with the interpretive elegance of the humanities. In *A Pluralistic Universe* James (1996, p. 45) wrote,

philosophers have always aimed at cleaning up the litter with which the world apparently is filled. They have substituted economical and orderly conceptions of the first sensible tangle; and whether they were morally elevated or only intellectually neat, they were at any rate always aesthetically pure and definite, and aimed at ascribing to the world something clean and intellectual in the way of inner structure.

The same could be said not just of philosophy, but of most academic disciplines.

James was a pluralist. Truth, he suggested, is a product of selection, not discovery, so it behooves us to employ methods of selection that will yield truths of a useful sort. As careful and astute a thinker as James would doubtless exemplify his own philosophy, and it is perhaps for this reason that he chose to navigate between disciplines. A discipline carves out a well-lit space, sheltered against what James (1996, p. 73) called the “flux of sensible experience.” Within its walls things make sense: you can discover, you can know, and you might even understand. But here is what James realized: if the flux defies our understanding, it also defines our reality (or, more accurately, realities). As such, the truth we ought to be seeking is perhaps not as cleanly bounded as we might hope it to be.

I do not compare myself to James in intellect or innovativeness, but I do share his fascination with the flux. Since childhood I have had a perhaps preternatural and often dysfunctional obsession with meaning. However, whereas this obsession once focused primarily on myself – who am I, what is my place – of late it has become a broader question about the human species – who are we, what is our place. Much as I would like to walk away from a Ph.D. program with at least some sense of resolution, I am not

convinced clear answers are achievable, or even desirable. What I have are loose ends, uncertainties, half-finished thoughts, and ideas in the making. But this messiness, I believe, is part of what it is to be human. Confronting the chaos is puzzling, astounding, defiant, and infinitely enriching work.

The integration of philosophy and psychology is hardly unique, of course, and I do not wish to overstate what is really quite mundane. My dissertation is unremarkable. I present this work as a humble offering to the flux - no more and no less.

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APPENDICES

APPENDIX A: SURVEY INSTRUMENT

Information about respondents

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

Social desirability (true/false)

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

Moral inclusivity

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

1. Every person has value above and beyond his or her usefulness for others.
2. In general, I would say human suffering is a moral issue.
3. As a basic principle, people ought to demonstrate respect for other individual people.
4. The wellbeing of an individual animal matters, even if it does not affect the wellbeing of people.

5. Every individual animal possesses a dignity that deserves respect.
6. The wellbeing of individual plants is *not* a matter of moral concern to me.
7. Every plant deserves respect as a living creature.

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

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

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

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

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

“I enjoy reading _____.”

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

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

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

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

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

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

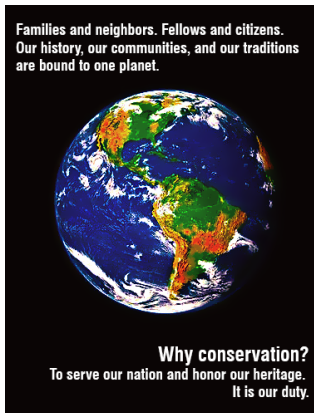
19. _____ has value above and beyond any use it may serve for others.

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

- l. A wild rainforest ecosystem
- m. An agricultural ecosystem

Outreach messages

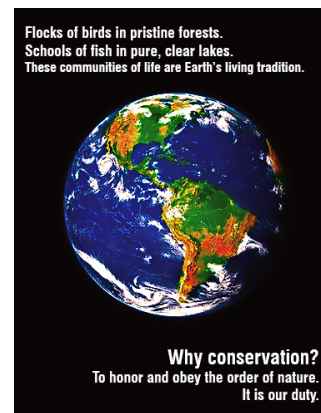
Please consider the following flyer carefully, before answering the questions below it:



(Above) Human beneficiary, binding moral foundation



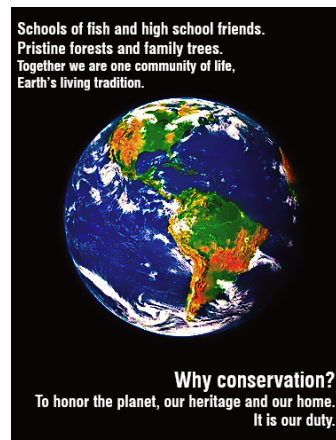
(Above) Human beneficiary, individualizing moral foundation



(Above) Nonhuman beneficiary, binding moral foundation



Nonhuman beneficiary, individualizing moral foundation



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



Combined beneficiaries, individualizing moral foundation



Attitudes, moral salience, and hypothetical donation

Items rated 1-7, Strongly Disagree-Strongly Agree, unless otherwise noted

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

Manipulation checks

Items rated 1-7, Strongly Disagree-Strongly Agree. Respondents viewed the same flyer again at the top of the page before answering these questions.

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

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

Donation

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

Debrief

Thank you again for your participation. At this time we would like to disclose the full objectives of the survey, some of which were withheld from the study description you viewed previously. The message you saw was one of seven we have used in this study, each carefully crafted to express certain types of moral concern. We are investigating whether different types of moral messages affect whether people donate money to support conservation work. Your decision to donate or not donate some portion of the \$5 (and, if you chose to donate, the amount) will be recorded as data. We *will* donate the amount you entered on the previous page to a conservation organization, and the balance *will* be paid to you via email.

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

APPENDIX B: SUPPLEMENTAL INFORMATION TO CHAPTER ONE

Second manipulated factor: moral foundation

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

Although humans arguably evolved to recognize and respond to the full suite of moral foundations, each of which served a unique and critical adaptive purpose (Haidt and Joseph, 2004), researchers have found that the relative importance placed on different moral foundations in modern times tends to vary by culture or social group. For example, binding moral foundations often resonate strongly with self-identified conservatives in the U.S., while individualizing moral foundations often resonate strongly with self-identified U.S. liberals (Graham et al., 2009). These associations are not only of theoretical interest, but also have important practical implications. Of particular note are reported effects in persuasive messaging contexts. In experiments similar to the one reported in the main paper, researchers have manipulated outreach messages to place more or less emphasis on different moral foundations or sets of foundations, often finding

that the interaction of moral foundation with political orientation explains a significant amount of variation in people's attitudinal and behavioral responses to treatment messages (e.g., Winterich et al., 2012; Kidwell et al., 2013; Wolsko et al., 2016). To control for these potential effects in analyses reported in the main paper, we included terms for both the moral foundation factor and its interaction with political orientation in statistical models.

Beneficiary manipulation checks

Two items assessed the effectiveness of the beneficiary message manipulations by asking respondents whether the message they viewed conveyed concern for people (item one) and nonhuman beings (item two). In a successful manipulation, mean ratings on item one should have been higher in both the human (HMN) and combined (COMB) message conditions, compared with the nonhuman (NON) message condition, while NON and the control should have been statistically equivalent; and mean ratings on item two should have been higher in both NON and COMB, compared with HMN, while HMN and the control should have been statistically equivalent. We used Welch's F-test (which is robust to violations of equal error variance between groups) to test for overall differences between beneficiary levels, and Games-Howell post-hoc analysis (which also does not assume equal variance) for subsequent pairwise comparisons. Full results are reported in Table A1.

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

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

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

These results suggest the control flyer was not “neutral” on the beneficiary manipulation. In addition to statistical comparisons between the control and the three treatments, mean ratings on both manipulation check items both fell on the “agree” side of the scale, indicating that respondents perceived concern for both humans and nonhumans in the message. We therefore omitted the control from further analysis. Although we lost the ability to compare treatment effects against a no-beneficiary case, comparisons between the three levels of the beneficiary treatment were more pertinent to our main research interests and allowed us to test our hypotheses. Nonetheless, future research should seek to develop a more effective control message. Given the low face

validity of a no-beneficiary message (recognizing that conservationists and conservation organizations are unlikely to conduct outreach without invoking any sort of beneficiary), a more viable and informative control may be a no-message condition.

Statistical assumptions

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

Appendix B tables

Table B.1 Results of Welch's F-Tests on beneficiary manipulation check items, followed by Games-Howell post-hoc analyses testing for pairwise differences. For each manipulation check item, non-significant pairwise differences ($p > 0.05$) between human (HMN), nonhuman (NON), combined (COMB), and the control are denoted by shared superscript letters. $N = 1331$

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

Table B.2 Chapter One sample descriptive information. Median age is in the 45-54 year range and median household income is in the \$50,000-\$75,000 bracket. N = 1141

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

Table B.3 Results of analysis of covariance (ANCOVA) on attitudes. All demographic controls were treated as continuous variables. Moral foundation, the second manipulated factor, was also included as a control variable, along with the interaction of moral foundation and political orientation. *significant at $p = 0.05$ **significant at $p = 0.01$ ***significant at $p = 0.001$

	df	F	Mean square estimate	p	η_p^2
Beneficiary	2, 997	0.692	0.557	0.50	0.001
Inclusivity	2, 997	205.61	165.59	<0.001***	0.292
Beneficiary x inclusivity	4, 997	1.13	0.91	0.34	0.004
Religiosity	1, 997	1.12	0.90	0.29	0.001
Education	1, 997	5.71	4.60	0.02*	0.006
Age	1, 997	3.61	2.91	0.06	0.004
Income	1, 997	1.26	1.01	0.26	0.001
Political orientation	1, 997	28.74	23.15	<0.001***	0.028
Moral foundation	1, 997	0.90	0.72	0.34	0.001
Moral foundation x political orientation	1, 997	0.80	0.64	0.37	0.001
$R^2 = 0.38$, <i>adjusted</i> $R^2 = 0.37$					

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

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

Table B.5 Results of analysis of covariance (ANCOVA) on non-zero donation amounts. All demographic controls were treated as continuous variables. Moral foundation, the second manipulated factor, was also included as a control variable, along with the interaction of moral foundation and political orientation. *significant at $p = 0.05$ **significant at $p = 0.01$ ***significant at $p = 0.001$

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

APPENDIX C: SUPPLEMENTAL INFORMATION TO CHAPTER THREE

Data weighting

We compared our respondents against the most recent US Census data to assess the potential for bias. The sample is slightly older and more educated, and has a higher proportion of self-identified Caucasians than the general US public. Females are overrepresented by a small margin, more respondents self-identified as political liberals, and fewer self-identified as moderates compared with the general population. Because we found only weak correlations ($r < 0.2$) between demographic variables and the moral inclusivity items; and because we are primarily interested in relationships between variables rather than estimates, *per se* (Field, 2013), we chose not to weight the data.

Appendix C tables

Table C.1 Chapter Three sample descriptive information by worldview. The survey included self-report measures of political orientation and religiosity. Additional demographic information was appended to the dataset from respondents' Qualtrics panelist profiles. N = 1331 Counts do not sum to totals because some respondents did not provide all demographic information.

	Anthropocentric n = 94	Zoocentric n = 112	Biocentric n = 30	Ecocentric n = 427	All others n = 668
Gender					
Male	64	56	11	147	346
Female	30	56	19	280	322
Education					
HS or less	4	6	8	67	93
Some college	15	25	9	107	122
Associate's	4	9	1	43	51
Vocational or technical	1	5	1	17	11
Bachelor's	37	44	8	110	236
Graduate or professional	33	23	3	80	150
Political orientation					
Conservative	66	69	17	187	294
Liberal	18	24	8	190	283
Centrist	8	16	4	47	77
Race					
African American	4	5	6	25	42
Asian American	3	6	1	20	28
Caucasian	82	96	22	343	558
Native American	-	1	-	9	-
Native Hawaiian	1	-	1	1	1
Other race	2	2	-	19	24
Religiosity					
Not religious	21	22	5	116	215
Somewhat religious	38	52	10	200	298
Very religious	34	38	15	110	151
Median age range	45-54	45-54	35-44	45-54	45-54
Median Income	\$75,000- 99,999	\$50,000- 74,999	\$25,000- 49,999	\$50,000- 74,999	\$50,000- 74,999

Table C.2 Results of repeated measures analysis of variance (ANOVA) including atheoretical worldview, separated by type of specific entity (animal, vegetative organism, collective, or human). Worldview affiliation is a between-subjects factor and specific entity is a within-subjects factor. Scores on entity-based inclusivity harm/value composites (for animals, vegetative organisms, and collectives) or harm items (for humans) are the response variables. Mauchly's test indicated non-sphericity in all four analyses, so reported F-values use the Greenhouse-Geisser correction. Different superscript letters (horizontally) indicate estimated means differ significantly between worldviews ($p < 0.05$), and different superscript numbers (vertically) indicate estimated means differ significantly between entities of a type.

		Anthropocentric	Zoocentric	Atheoretical	Ecocentric	Biocentric	F _{between}	η_p^2 _{between}
Animals	Overall	4.17 (0.09) ^a	4.81 (0.08) ^b	5.51 (0.04) ^c	5.89 (0.04) ^d	4.47 (0.16) ^{a,b}	103.75	0.28
<i>Dog</i>	5.78 (0.04) ¹	5.06 (0.09) ^{a/1}	5.71 (0.09) ^{b/1}	6.33 (0.05) ^{c/1}	6.52 (0.04) ^{d/1}	5.28 (0.17) ^{a,b/1}		0.21
<i>Bald eagle</i>	5.61 (0.05) ²	4.94 (0.10) ^{a/1}	5.54 (0.09) ^{b/2}	6.23 (0.05) ^{c/2}	6.48 (0.05) ^{d/1}	4.88 (0.18) ^{a/2}		0.21
<i>Cow</i>	5.25 (0.06) ³	4.37 (0.12) ^{a/2}	5.09 (0.11) ^{b/3}	5.85 (0.06) ^{c/3}	6.18 (0.06) ^{d/2}	4.77 (0.21) ^{a,b/2,3}		0.20
<i>Cougar</i>	5.18 (0.06) ³	4.32 (0.12) ^{a/2}	5.07 (0.11) ^{b/3}	5.89 (0.06) ^{c/3}	6.21 (0.06) ^{d/2}	4.43 (0.21) ^{a,b/3}		0.21
<i>Fly</i>	3.03 (0.08) ⁴	2.15 (0.17) ^{a/3}	2.66 (0.16) ^{a/4}	3.24 (0.08) ^{b/4}	4.08 (0.08) ^{c/3}	3.00 (0.31) ^{a,b/4}		0.12
F _{within}	612.72							
η_p^2 _{within}	0.37	0.18	0.22	0.51	0.41	0.05		
Living beings	Overall	2.67 (0.13) ^a	3.14 (0.12) ^a	3.70 (0.06) ^b	4.78 (0.06) ^c	3.37 (0.23) ^{a,b}	90.75	0.26
<i>Houseplant</i>	3.86 (0.07) ¹	2.75 (0.15) ^{a/1}	3.47 (0.14) ^{b/1}	3.96 (0.07) ^{c/1}	5.38 (0.07) ^{d/1}	3.73 (0.27) ^{b,c/1}		0.28
<i>Oak</i>	4.59 (0.06) ²	3.56 (0.13) ^{a/2}	4.21 (0.12) ^{b/2}	4.99 (0.07) ^{c/2}	6.04 (0.06) ^{d/2}	4.13 (0.24) ^{a,b/1}		0.29
<i>Fungus</i>	3.11 (0.08) ³	2.40 (0.17) ^{a/1}	2.75 (0.15) ^{a/3}	3.26 (0.08) ^{b/3}	4.18 (0.08) ^{c/3}	2.98 (0.30) ^{a,b/2}		0.13
<i>Poison ivy</i>	2.57 (0.08) ⁴	1.95 (0.17) ^{a/3}	2.14 (0.16) ^{a,b/4}	2.60 (0.08) ^{b/4}	3.51 (0.08) ^{c/4}	2.63 (0.30) ^{a,b,c/2}		0.11
F _{within}	325.41							
η_p^2 _{within}	0.24	0.07	0.13	0.42	0.46	0.02		
Collectives	Overall	4.02 (0.09) ^a	4.52 (0.08) ^b	5.39 (0.04) ^c	5.74 (0.04) ^d	4.23 (0.15) ^{a,b}	121.03	0.31
<i>Elephants</i>	5.58 (0.05) ¹	4.89 (0.10) ^{a/1}	5.41 (0.09) ^{b/1}	6.37 (0.05) ^{c/1}	6.50 (0.05) ^{c/1}	4.72 (0.18) ^{a/1}		0.25
<i>Mosquitoes</i>	2.63 (0.08) ²	1.87 (0.18) ^{a/2}	2.15 (0.17) ^{a/2}	2.76 (0.09) ^{b/2}	3.50 (0.08) ^{c/2}	2.87 (0.32) ^{a,b,c/2}		0.09
<i>Rainforest</i>	5.47 (0.05) ³	4.66 (0.10) ^{a/3}	5.30 (0.10) ^{b/1}	6.24 (0.05) ^{c/3}	6.52 (0.05) ^{d/1}	4.65 (0.18) ^{a/1}		0.28
<i>Agricultural</i>	5.44 (0.05) ³	4.66 (0.11) ^{a/3}	5.24 (0.10) ^{b/1}	6.18 (0.05) ^{c/3}	6.46 (0.05) ^{d/1}	4.68 (0.19) ^{a,b/1}		0.25
F _{within}	828.93							
η_p^2 _{within}	0.44	0.18	0.23	0.57	0.50	0.03		
Humans	Overall	6.11 (0.10) ^a	6.09 (0.09) ^a	6.40 (0.05) ^a	6.52 (0.05) ^b	5.69 (0.18) ^a	9.93	0.04
<i>Myself</i>	6.09 (0.06) ^{1,2}	5.97 (0.14) ^{a/1,3}	6.12 (0.13) ^{a,b/1,2}	6.15 (0.07) ^{a/1}	6.43 (0.07) ^{b/1,2}	5.77 (0.24) ^{a,b/1,2}		0.02
<i>My family</i>	6.36 (0.05) ³	6.39 (0.11) ^{a,b,c/2}	6.29 (0.10) ^{a,c/1}	6.56 (0.05) ^{a,b/2}	6.67 (0.05) ^{b/3}	5.90 (0.19) ^{c/1}		0.02
<i>Americans</i>	6.21 (0.05) ¹	6.15 (0.11) ^{a/1}	6.12 (0.10) ^{a/1}	6.49 (0.05) ^{b/2}	6.55 (0.05) ^{b/1}	5.73 (0.19) ^{a/1}		0.03
<i>Other country</i>	5.99 (0.06) ²	5.94 (0.12) ^{a/3}	5.84 (0.11) ^{a/2}	6.38 (0.05) ^{b/3}	6.43 (0.06) ^{b/2}	5.37 (0.21) ^{a/2}		0.05
F _{within}	24.22							
η_p^2 _{within}	0.02	0.03	0.03	0.07	0.04	0.01		