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Toward a More Holistic Worldview: Environmental Values in Context

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Thesis adviser(s) _____ Jesse P. Van Gerven _____
Date 5/5/21

Reader(s) Jamie Valentine, *Jamie Valentine* _____
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Certified by _____
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Toward a More Holistic Worldview: Environmental Values in Context

A Thesis

Presented to the Department of Environmental Studies

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Erica Lynne Walters

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Abstract

This study extensively examines the formation of pro-environmental behaviors as mediated by the Value-Belief-Norm (VBN) Theory. Using this theoretical framework, qualitative, in-depth interviews were conducted with a small number of Butler University students (n=10). The findings of the data collection demonstrate the limitations of the VBN Theory when applied to pro-environmental behavior. Data analysis demonstrates the role that formative experiences, environmental education, and connectedness to nature can play as intervening influences in the linear translation posited by the VBN Theory. Moreover, the confluence of various values that emerged among research participants suggests the need for a more holistic value orientation based on ecological integrity and the recognition of the connections, rather than distinctions, between systems. This study therefore offers the grounds for the refinement and expansion of the VBN Theory based on the limitations described above. In addition, Indigenous knowledge presents an existing resource for a robust recognition of ecological interdependence and the ways in which human activity can uphold and prolong environmental integrity. As such, Indigenous knowledge systems offer a fruitful opportunity for future research and environmental action.

Introduction

The global climate crisis threatens to disrupt every aspect of our lives, demanding widespread shifts to decarbonize the economy and transition to sustainable practices. The Intergovernmental Panel on Climate Change's "Global Warming of 1.5°C" special report calls for limiting anthropogenic temperature increases to this benchmark in order to avoid the most devastating outcomes (Intergovernmental Panel on Climate Change [IPCC], 2018). The ongoing and projected environmental consequences of climate change encompass rising sea levels, extreme temperatures, ocean acidification, and precipitation changes, to name a few (IPCC, 2018). However, the IPCC identifies the 1.5°C benchmark as offering the best opportunity for humans to adapt to these conditions (2018). The implications of this report are especially significant for the United States; although the United States constitutes only 4% of the global population, it is "responsible for almost a third of the excess carbon dioxide in the atmosphere" (Ellis & Alteen, 2021). The need for decisive and centralized government action cannot be ignored to ensure an equitable transition away from the dependence on fossil fuels. However, the high-carbon lifestyles of Americans, characterized by suburban sprawl, vehicle dependence, and consumption of animal products, to name a few, must also transition to environmentally sustainable outcomes to avoid the worst projected consequences of climate change. The Project Drawdown website (<https://www.drawdown.org/>) offers a vision of the many solutions which, if applied in conjunction with each other, can mitigate anthropogenic climate change. These solutions range from individual action to centralized solutions.

Despite the fact that individual changes alone are not enough to confront this crisis, they (and the thought processes that accompany them) are a critical part of the fully-integrated ideological and structural shift that is demanded by this crisis (Mann, 2019). In addition, personal prioritization of pro-environmental behavior is likely to lead individuals to demand transformative action of their representatives and government, which promises to improve mobilization efforts across the United States. Finally, the effects of social contagion for pro-environmental behavior have been documented in past research (Frank, 2020). Social contagion refers to the phenomenon by which an individual's behaviors influence those of others, which amplifies the power of any individual's conscious choices as an impetus for more widespread change.

This thesis will specifically investigate the role of "clusters of compatible values" (known as value orientations) in shaping pro-environmental behavior (Hansla, Gamble, Juliusson, & Garling, 2008). In recognition of the role that values play in shaping pro-environmental behavior, the Value-Belief-Norm (VBN) Theory is used as a general theoretical framework for this research and analysis. The VBN Theory posits that groups of values directly influence general beliefs, which in turn give way to specific behavioral beliefs and patterns (De Groot & Steg, 2007). This theoretical framework (VBN) is discussed in greater detail in the Background of this study.

In addition, the interaction among values, beliefs, and norms is complex, making it difficult to understand actions as a direct product of values (Whitley, Takahashi, Zwickle, Besley, & Lertpratchya, 2016). Connectedness to nature has also been identified

as having a potentially significant influence on environmental values and, in turn, pro-environmental behavior (Pereira & Forster, 2015). Similarly, awareness of environmental consequences has been shown to have a critical effect on pro-environmental behavior (Hansla, et al., 2008). In order to utilize the VBN Theory while recognizing these refinements, this study uses the VBN framework as a foundation while investigating the role of other external influences on pro-environmental behavior. More specifically, this thesis intensively examines values, awareness of environmental consequences, and feelings of connectedness to nature in order to understand the beliefs and environmentally-relevant behaviors that they underlie. The in-depth qualitative data in this study has been collected through interviews with ten Butler University students (the demographics of participants and justification for their selection are further described in the Methods section). Central findings from the data analysis include the relevance of formative experiences, environmental education, and systems thinking, as well as the confluence of values that underlie pro-environmental behavior. These findings suggest the need for a more holistic value orientation grounded in ecological integrity and a recognition of the human dependence on nature. Indigenous knowledge offers an existing resource for a holistic approach, making it a fruitful area for future study and pro-environmental solutions and education.

Background

The Value-Belief-Norm (VBN) Theory posits that values directly influence general beliefs, which in turn give way to specific behavioral beliefs and patterns (De

Groot & Steg, 2008). Under the VBN Theory, values are the most stable and enduring traits, and they refer to the broader concerns that underlie human behavior. These concerns can involve but are not limited to consequences to the biosphere, other humans, and oneself (Pereira & Forster, 2015). Values therefore provide the basis for the formation of the psychological characteristics that shape human attitudes and behavior (Whitley, et al., 2016). These characteristics include beliefs, which reflect how an individual contextualizes their values. The behavioral patterns, or personal behavior norms, that result from these beliefs are an important determinant of an individual's environmental impact, making values and beliefs useful areas for study in the context of the climate crisis. The general translation of values into beliefs and norms under the model of the VBN Theory therefore follows a linear path (values→ beliefs→ norms). As this research will suggest, this linear structure does not fully reflect the real-world nuances that emerge when considering how values shape environmentally relevant beliefs and behaviors. Rather, the research findings suggest that external influences like connectedness to nature, environmental education, and increased awareness of consequences can play intervening roles in this translation process, thus raising the importance of refining the VBN framework (this refinement is discussed in the Analysis section).

In addition, the VBN Theory allows for different values-based interpretations of environmental concern and action. For example, individuals with self-serving (egoistic) value orientations may express concern for the environment because of negative impacts

in their own lives, while environmental (biospheric) value orientations lead to environmental concern for the ecosystem as a whole (Ghazvini, Kian, & Sarmento, 2016; Hansla, et al., 2008). As a result, this research aims to isolate the specific values operating beneath a given individual's environmental concern.

Using the VBN Theory as a general framework, existing research indicates the roles that identity and self-efficacy may play as important psychological structures in the "belief" stage of the translation of values into behaviors (Gatersleben, Murtagh, & Abrahamse, 2012; Sawitri, Hadiyanto, & Hadi, 2014). Additionally, environmental values have been shown to partially mediate the relationship between connectedness to nature and pro-environmental behavior (Pereira & Forster, 2015). Past research, therefore, suggests that identity, self-efficacy, and connectedness to nature may also be relevant in understanding the formation of environmentally minded behaviors.

Although the VBN Theory offers a useful foundation for understanding environmentally relevant values, beliefs, and behaviors, existing research has demonstrated that other relevant influences on pro-environmental behavior are not easily accommodated by this linear framework. Specifically, the rigid and simplistic structure of the VBN Theory does not allow for recognition of the influence that new experiences (especially education) may have on an individual. As a result, the VBN Theory is utilized in this study as a foundational framework for data analysis while allowing for the incorporation of the external experiences and feelings of individuals. The limitations of

the VBN Theory in understanding pro-environmental values, beliefs, and behaviors are further explored in the Discussion section.

In order to explore the values that underlie individual beliefs and norms according to the VBN Theory, participants in this study have been evaluated for their value orientations, particularly for a biospheric value orientation. Biospheric values, in contrast to egoistic values, indicate a widespread concern for the environment and for living species and support the awareness that human actions have important environmental consequences (Ghazvini et al., 2016, Nair & Little, 2016). In response, environmental knowledge (specifically, the awareness of the environmental consequences of human actions) and the formation of this knowledge are extensively examined in this study.

The New Environmental Paradigm (NEP), which is closely related to a biospheric value orientation, provides an important basis for the investigation of such environmental values. The NEP is an alternative to the Dominant Social Paradigm, the latter of which emphasizes consumption and economic freedom and is related to egoistic, or self-serving, value orientations (Nair & Little, 2016). In contrast, the NEP, which is based on biospheric values, conceives of humans as components of intricate ecological networks and thus invokes a sense of responsibility to engage in pro-environmental behaviors (Nair & Little, 2016). Nonetheless, it is important to consider that any given pro-environmental behavior can correspond to various value orientations (i.e. biospheric or egoistic), as such behavior can be motivated by self-interest as well as concern for nature (Ghazvini et al.,

2016). It is therefore critical to identify the specific values at work in the translation mediated by the VBN Theory. As a result, the interview questions used for data collection for this thesis aim to identify specific values to separate them from both beliefs and behaviors and study the top-down relationship (values → beliefs → norms) proposed by the VBN Theory.

As Nair and Little (2016) point out, one important acknowledgment relevant to the VBN Theory is that there is no such thing as truly “green” consumption; rather, we can choose to minimize the environmental consequences of our actions by making certain conscientious decisions. Thus, the translation of values and beliefs into behaviors is further complicated by the fact that benevolent intentions cannot be equated with ideal environmental outcomes. Reflecting this contingency, past research has highlighted the difficulty of defining pro-environmental behavior, and pro-environmental intentions do not always correspond with environmentally sound outcomes (Nair & Little, 2016). Most economic activity, at least in a fossil-fuel dependent economy, has detrimental environmental consequences, and the best environmental outcomes are not always those that are most tangible or easily recognized as being “green.” Consequently, relevant research about pro-environmental behavior does best to study both values and beliefs *and* awareness of environmental consequences. As such, this research intensively investigates awareness of consequences and its development through environmentally relevant education. The incorporation of awareness of consequences and education into the VBN framework also improves the utility of the VBN framework by incorporating greater

flexibility into the rigid, linear process it proposes. A general appraisal of the usefulness of the VBN theory can be found in the Analysis section.

Similarly, existing research has demonstrated a correlation between biospheric environmental concern and awareness of consequences to the biosphere (Hansla et al., 2008), and this study will further explore this relationship and its implications for behavior. Hansla et al. (2008) also identify awareness of consequences as a determinant of pro-environmental behavior, making this a fruitful area for study when considering how we might promote such behavior on a large scale. These factors also further justify the use of in-depth qualitative research methods (see “Methods”), as the translation of values into behavior depends on various intermediate factors that are not easily discerned through quantitative research. Qualitative data also offer insight into intervening experiences like environmental education, which suggest the need for a more flexible theoretical framework.

In response to the foundation of the VBN framework and existing critiques surrounding its applicability, this thesis will explore the following questions:

How are values translated into environmentally relevant behavior?; How does our understanding of ourselves as working parts of an ecosystem contribute to our behavior as consumers?; How is this understanding mediated through the VBN Theory?; What role do connectedness to nature and awareness of consequences play in the translation of values into behavior via the VBN Theory?; Which other experiences shape individual values, beliefs, and behaviors?

Methods

The research questions outlined above have been investigated through in-depth, open-ended interviews with ten environmentally oriented university students (see below). This method of data collection is justified by the lack of existing qualitative data surrounding these questions. The majority of existing relevant research involves quantitative data (Ghazvini, et al. 2016, Whitley, et al., 2016), yet an in-depth qualitative exploration of the relationship between values and behaviors has the potential to reveal intermediate factors (such as a lack of self-efficacy or environmental education) in this relationship (Gatersleben et al., 2012; Sawitri et al., 2015). Likewise, past studies have called for qualitative measures to complement the quantitative scale of the New Environmental Paradigm (Bernstein & Szuster, 2018). As a result, a qualitative approach by means of individual interviews is likely to provide relevant information surrounding the complex relationship between values and behaviors. In addition, qualitative research can help to explain the “gap between knowledge, attitudes, and behaviors” that Whitley et al. (2016, p. 246) describe, which may reflect a lack of understanding about effective environmental actions.

The merits of qualitative research make it a tool well-suited for this investigation of the deep structures of human beliefs and values. As opposed to quantitative research, qualitative studies excel at exploring such social and behavioral topics in great depth. This research aims to understand the elaborate relationship between values and behaviors, and as Agius (2013) contends, “Research conducted using qualitative methods is

normally done with an intent to preserve the inherent complexities of human behaviour” (p. 204). Finally, if we can better understand the relationship between values and actions, we have a greater possibility of creating societal solutions that cause individuals to rethink the ways in which their behavior affects the environment.

As a specific manifestation of the questions outlined in the background, this study will investigate which processes serve to translate environmentally-oriented values into corresponding individual practices. In other words, the relationship between environmental values and environmentally-relevant behaviors is qualitatively investigated to examine the influence of factors such as beliefs, connectedness to nature, and awareness of environmental consequences.

The research in this study was conducted through a series of individual, in-depth virtual interviews with a small sample of Butler University students (n=10). Study participants were selected and interviewed until theoretical saturation was reached. All participants were selected because they are self-identified environmentalists on Butler’s campus who, through organizational involvement and academic pursuits, exhibit pro-environmental behavior. Ideal candidates for this research are those with pro-environmental values, and individuals that identify as environmentalists are likely to be acting upon these values. This process of participant selection is justified by past research, as the correlation between pro-environmental values and environmentalist identity has been demonstrated in existing studies (Gatersleben et al., 2012).

Strategic convenience sampling was utilized to select study participants. Given the limited number of environmental networks on Butler University's campus, students who exhibited pro-environmental behavior were often members of the same social circles. As a result, snowball sampling was also utilized when participants recommended other students based on their exhibition of pro-environmental behavior. This arrangement enabled individuals who were formally or informally identified as being environmentally inclined to be contacted with a recruitment email and thus invited to participate in the study.

Study participants represented a wide variety of academic backgrounds, from natural and social sciences to business and the arts. However, these individuals were unified by their common interest in and dedication to environmental activism. The manifestation of environmental interest varied among participants, including involvement in environmental organizations and committees on campus, attendance of environmental events, and enrollment in Butler University's Environmental Studies department. The diversity of these manifestations of environmental concern is intended to provide a more comprehensive understanding of values, beliefs, and behaviors among college students interested in environmental issues. Although only individuals with existing environmental concern have been included in this study, the insights that this research yields are intended to provide an understanding of how environmentally relevant values, beliefs, and behaviors are developed. This understanding, in turn, can be used as a reference for how individual environmental action might be fostered on a larger scale.

The interview questions utilized during research serve to measure values characteristic of both the New Environmental Paradigm and the biospheric value orientation to assess participants' environmental values. To assess participants on a behavioral dimension, interview questions investigate consumer norms and the beliefs that underlie them (i.e. awareness involved in purchasing and use of single-use products). The role of tangibility in pro-environmental behavior is explored as a potential factor. For instance, are individuals more likely to take environmental actions for which they can see the direct impact as opposed to those that require a deeper understanding of environmental processes? The complete interview schedule is included in Appendix A.

Participants were also asked about formative experiences, both educational and personal, that have influenced their environmental values, beliefs, and behavior. Several interview questions also aim to explore connectedness to nature, the presence of which indicates a deeper emotional connection to and inclusion in the environment (Pereira & Forster, 2015; Ghazvini et al., 2016). Finally, participants were asked about their beliefs, identities, and senses of self-efficacy in order to investigate the translation of values into actions as outlined by the VBN Theory. Existing research, which is detailed in background, provides the framework for meaningful qualitative analysis of the data. The VBN Theory is used as the primary theoretical framework for this analysis.

Finally, to protect the identity of research participants, all individuals will be referred to using gender-neutral pronouns. As a result, "they" will be used to identify participants in the third-person singular.

Data Analysis

The qualitative data obtained through the virtual interviews in this study are analyzed using the VBN Theory as a general analytical framework while incorporating the principles of the New Environmental Paradigm. Interview questions are designed to isolate values, beliefs, and behaviors to better understand the relationship between these elements. Other elements analyzed are awareness of environmental and social consequences, self-efficacy, and connectedness to nature. Various key themes emerged from this analysis, several of which provide the basis for criticism of the linear translation of values into behaviors as mediated by the VBN Theory. These findings include the influential role of formative experiences, environmental education (in both formal and informal contexts), and systems thinking. The confluence of various value orientations also emerged as an important trend in the data.

Analysis: Themes in the Context of the VBN Framework

The Role of Formative Experiences

Various patterns emerged throughout the in-depth interviews with participants, which allows for the support and refinement of the theoretical framework (VBN Theory) outlined above. One trend that was consistent among every individual interviewed was the importance of formative experiences in the development of environmentally relevant values. However, these experiences occurred at different times in the participants' lives, suggesting that the process of developing pro-environmental values can vary widely. For instance, several participants described formative experiences early in life, especially

meaningful experiences outdoors. These outdoor experiences were frequently related to a general feeling of connectedness to nature, and participants described feeling dismay when first learning about environmental degradation. When asked about formative experiences that promoted a sense of environmental responsibility, one individual responded:

I grew up with a creek and [the] woods in my backyard, so I was always out there and it was always so much fun... We were all playing in the woods all the time, so I think, just being out in those spaces a lot gave me an appreciation for them... [It's] probably how my parents raised me too; we always had a garden and had to think about eating healthy whole foods... and I would always see trash on the side of the road and [wonder], 'How could anybody ever do that? How do you think it's okay to roll down your window and throw trash out the window?'...If I ever did that I know I would have gotten scolded. So I think, them raising me to be more thoughtful about my actions and how they impact the world around me has influenced my passion for the environment.

As this individual describes, the biospheric values they express are closely related to the formative experiences they had in nature, as well as the values that their parents instilled in them from a very young age. As such, this participant signals both a powerful sense of connection to nature and a sense of environmental responsibility that aligns with their morals.

Another participant, who grew up in the Southwest, similarly noted that the possibility of littering seemed unthinkable even as a child because of a general sense of respect for nature. This individual's parents also made consistent efforts to promote environmental education from a young age. When asked about formative experiences and their connection to environmental responsibility, this individual responded:

I can clearly remember when I was elementary-school age my parents would take us camping to national monuments, and witnessing the beauty of the natural landscape was really powerful from a young age and then, at the same time, learning specifically the importance of really simple stuff like making sure you take all the trash that you bring with you, and leaving a place the way you found it for others.

In alignment with these formative experiences, this participant later described having biospheric values from a young age and gradually understanding the social consequences of environmental issues due to education later in life; this represents a shift to merge a more general altruistic value orientation with longstanding biospheric values. In this case, growing awareness of the intersections between environmental and social issues led to the development of new values and beliefs. Although the impact of biophilia shaped this individual's values during their childhood, they described feeling "a moral or even ethical obligation to [their] generation and to those that follow." These feelings of social obligation again indicate an altruistic value orientation, which, as the participant

describes, evolved from an increase in the awareness of the consequences of social issues. This individual describes this change:

[My motivation for being an environmentalist] has definitely shifted. I used to primarily be concerned about environmental impacts like rising sea levels and habitat loss but then as I learned more and grew up, I realized that that stuff obviously is super important but then it all sort of feeds back into social systems as well. The rising sea levels lead to coastal cities being displaced and increasing weather patterns threaten other communities.

As this participant describes, the process of learning about social issues helped them draw the connections between social and natural systems. This individual's description therefore offers insight into the impact that new information and education can have on beliefs.

Another research participant with a limited environmental upbringing expanded their general altruistic values to include biospheric values. However, in a fashion similar to the participant described above, this individual's beliefs and behaviors shifted after learning about the consequences of environmental issues, especially in post-secondary education. In response to the above question regarding formative experiences, this individual responded, "I think growing up and being a young person in today's environment we've seen the impact of climate change... I've always thought about it but I didn't start taking action until college." Unlike the participants described above, both of whom had highly personal environmental experiences from a young age, this individual

experienced a more general exposure to environmental education. The informal education resulting from current events relevant to climate change led this participant to understand their own dependence on the environment. Similarly, they noted that “part of environmentalism is social justice and vice versa,” which indicates a recognition of intersecting systems. Education appears to play a powerful role in drawing connections between various issues, especially for those with a general altruistic value orientation.

These research findings show that participants with formative experiences early in life have a more robust understanding of ecological consequences and employ systems thinking (see below) to a greater extent. This is not to say, however, that these beliefs and understandings cannot be fostered later in life. As the third participant described above demonstrated, environmental values and awareness can be cultivated after adolescence, especially by means of increasing awareness of environmental consequences. This indicates the vital importance of environmental education, both formal and informal. Multiple participants cited the importance of social media in introducing them to environmental issues or to more nuanced understandings of the former. It should be noted, however, that the eagerness of these individuals to learn more about environmental issues generally stemmed from a longstanding altruistic value orientation. One individual, who described strong pro-environmental interest and formal environmental education from a young age, stated, “Social media was a big influence in making me more aware.” This participant also sought out new information through platforms like documentaries, as well a deck of informational cards entitled “100 Ways to Save the Planet.” In their words, “I pull one of these every day and tell myself, ‘Hey, I can do this today.’ And be

really conscious of what I'm doing, even if I already am super conscious... this is just a good reminder to stay refreshed.” This individual’s efforts indicate that a longstanding interest or investment in environmental issues can have a snowball-type effect in causing individuals to seek out new information. As a result, the population studied is likely to be more susceptible to the impacts of environmental or social justice education because of their existing biospheric or altruistic values and, consequently, a longstanding investment in learning more.

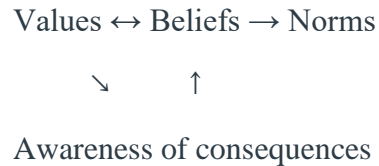
The development of environmental values and awareness also appears to be a lifelong process rather than values being a more stable trait, the latter of which is suggested by the VBN Theory. One participant who shared about their formative environmental experiences from an early age also spent time volunteering at an urban farming collective as a young adult. They described this latter experience as both educational and emotionally grounding: “It was a lot of fun and a good learning experience and it was really therapeutic in a way to just get out onto the farm.” This participant’s experience suggests the continued development of both a mental and emotional connection to nature that is common of biophilic experiences (biophilia is discussed in greater depth below). In other words, this experience served as an informal educational experience that simultaneously provoked a semi-spiritual connection to nature. The impact of such holistic experiences is also discussed in further depth below. However, this finding suggests that biospheric values, although they may be longstanding, are constantly subject to development and expansion.

The patterns described above suggest that the VBN theory, which posits that the translation of values into beliefs and subsequent behaviors adheres to a linear form (values → beliefs → norms), fails to account for the development of new values over time, especially changes that occur in response to education. Although some participants reflected environmental values that were instilled in them via family members from a young age, others did not have exposure to environmental education until mid-adolescence. For these participants, there was frequently a turning point after which they developed a new incorporation of environmental or social values into their existing value orientation. However, it is difficult to determine whether value systems themselves were changed or if certain normative beliefs about which behaviors are important to *honor* these values changed. For instance, an individual with a longstanding altruistic value orientation might experience a change in beliefs in response to environmental education, which in turn could alter how the individual acts upon their altruistic value orientation.

This qualitative study cannot establish a causal relationship between environmental education and changes in values, yet the research does suggest that a shift in beliefs due to new information can add new dimensions to individual value orientations. As a result, the simplistic translation posited by the VBN Theory (values → beliefs → norms) does not reflect the nuanced influence of beliefs on values or the impact that external factors like environmental education can have in intervening in this process. Moreover, participants' existing value orientations often led them to seek out further information about relevant environmental or social issues, meaning that values

themselves influence awareness of consequences. A more accurate model based on the findings of this research might look more like the following:

Figure 1



Note the interchange (rather than unidirectional relationship) between values and beliefs and the added element of awareness of consequences, which represents the integral impact of education. In addition, values influence awareness of consequences when they lead individuals to seek out information in accord with the former. This relationship, in turn, feeds back into beliefs because of the influence of new information acquired. These additions to and refinements of the VBN model provide a more complete reflection of the proposed relationship between environmentally relevant values, beliefs, and norms.

The Confluence of Values

A significant distinction emerged between participants who approached pro-environmental behaviors with biospheric versus altruistic values. However, the data also call into question the relevance of distinguishing between these value orientations. Those individuals with formative nature-oriented experiences early in life more often ascribed their behaviors to concern for biospheric outcomes, whereas those lacking these experiences were more likely to express general altruistic values (including concern for

social consequences and general feelings of wanting to do the “right” thing). Those participants who described formative experiences from a young age, especially with regard to connectedness to nature, frequently held biospheric value orientations that manifested in a robust sense of integration with the natural world. For several participants, this connection was near-spiritual, and for others, it was explicitly related to religion. Two participants cited their Catholic faith as the basis for many of their environmentally relevant values and beliefs. As one of these individuals described regarding their relationship with the natural world, “It's definitely very spiritual and it definitely connects a lot with my faith.” The principle of environmental stewardship, or the moral obligation of humans to care for, rather than exploit, nature emerged for these individuals. Similarly, they expressed a sense of duty and kinship towards all other living creatures, which de-centers humans as the primary concern of human values. One of these participants described:

Coming out of like a Catholic perspective, I think we were placed here as was every single other creature. We're all purposeful and we have a duty to respect one another... We aren't higher or better than any other species, we aren't higher than the crickets sitting on my front porch. We can do better things or we can do bigger things, but we're not better. There's one saint that says your view will radically change on the environment once you start to see every creature as your brother or sister.

The concern for species other than humans is characteristic of a biospheric value orientation (Pereira & Forster, 2015) and the New Environmental Paradigm (Hansla et al., 2008). However, a spiritual connection to nature was not exclusive to participants actively practicing religion. Others described nature as “grounding” and “bigger than [oneself].” This attitude provided these participants with a sense of transcendentalism and perspective. When one non-religious participant was asked about their relationship with the natural world, they responded:

[Nature] makes me feel connected to something bigger than myself and feel like there is some kind of purpose to this world, but it also makes me feel like I’m just one singular person on this huge big Earth, so what is going on in my day-to-day life is not that important in the greater scheme of everything.

This individual expressed feelings of spiritual, deep-rooted connection to nature that echoed the statements of the Catholic participants.

Conversely, another participant with limited childhood exposure to nature and environmental education began to consider environmental issues in college. This individual, whose experiences are described in the previous section of the analysis, conveyed a more limited understanding of environmental processes. Despite having a less robust ecological viewpoint, they engaged in pro-environmental actions corresponding to a general altruistic value orientation.

Other participants still approached environmental issues from both an altruistic and biospheric value orientation. One individual with an academic major in the natural

sciences exemplified a robust understanding of ecological processes and the role of humans within them. In response to a question about feelings of connection to nature associated with consumption, this individual replied, “Everything you do ends up--the whole life cycle idea of everything--comes from nature. So, it ends up back in nature. [As the person who consumes,] I’m like the intermediate between [an item’s] first initial home and then where it ends up.” However, this participant also expressed an altruistic value orientation. When asked about the connection between their environmentally minded actions and their feelings of connection to the environment, this individual responded: “It’s more of a kindness mindset: treat others how you want to be treated. I guess it’s always been semi-taught throughout grade school.” The coexistence of various value orientations begins to call into question the distinctions made between these orientations, as is discussed in greater depth below.

Participants across biospheric and altruistic value orientations conveyed a sense of moral obligation associated with these values and expressed both social and environmental motivations for environmentally responsible behavior. The results therefore call into question the distinction between biospheric and altruistic values, as individuals often presented elements of both orientations, and which of the two they presented seemed to be less significant to their environmentally relevant beliefs and behavior. (Note: in the context of anthropogenic climate change, behavior is the most important factor for consideration.) Although a biospheric value orientation appears to correspond to a more robust sense of connection to nature than a general altruistic value orientation, both value orientations led participants to take environmentally relevant

actions. In addition, it is often difficult to identify discrete values, especially when the relevant systems intersect, as is the case with environmental and social issues. Although participants varied in the dominant value orientations they expressed, those with altruistic value orientations incorporated or expressed biospheric value orientations because of their awareness of the interconnectedness of these issues and vice versa. For instance, participants rejected fast fashion for both environmental and social reasons, having realized that environmental degradation is often accompanied by social oppression and vice versa.

One interesting finding was the expression of self-preserving values in many participants. Although self-preservationism is typically attributed to an egoistic value orientation (Ghazvini et al., 2016), environmental consequences threaten both individual and collective outcomes. As a result, concern for oneself (and for other humans) is a logical part of a more general concern about environmental degradation, especially for those who are aware of their own dependence on natural systems. For instance, participants often cited environmental education as a factor that caused them to realize their own dependence on nature, especially through the use of systems thinking. One individual described:

A lot of the classes that I've taken have really connected me with [the environmental impact I have]. And it's made me more aware of how much of an impact I have because it's really easy to take yourself out of the natural

environment and just think of yourself as a person, and a human, rather than a person living on Earth.

This individual's experiences reflect the tendency to view social and natural systems as separate, yet they also demonstrate the power of education to help individuals see themselves in a broader ecological context. Despite the socially constructed binary between humans and nature (Robbins, Hintz, and Moore, 2014), concern for the environment is not mutually exclusive with concern for oneself. On the contrary, if we understand ourselves as part of an ecosystem in which we are all collectively invested, biospheric concerns inevitably extend to ourselves. In accord with this, research participants made statements that reflected awareness of their own dependence on nature and concern for themselves alongside present and future generations. As one participant noted, "If [the earth] goes up in flames, so do I." Many described feeling existential fears about the future, especially having grown up with media coverage about climate change. Another participant expressed frustration with older generations for failing to recognize the impact of climate change on the lives of young people, stating, "If you care about me, you might actually start to care about the things that I find important." Later in the interview, this same individual described reacting to climate change projections by considering their own age and imagining what life could look like for them and their future children with the changing climate.

This trend of concern for oneself in the context of global climate change and environmental degradation raises the question of whether we can clearly assign certain

concerns to specific value orientations. These individuals, understanding that their wellbeing is wholly dependent on the health of the ecosystem, have a vested interest in promoting environmental stability and integrity. Moreover, the categorization of different value orientations itself reflects often-arbitrary human constructs, especially the supposed division between social and natural systems. As Robbins et al. (2014) describe, the idea of wilderness as a separate entity from human activity is socially constructed, meaning that it is a product of social agreement within specific cultures (p. 129). In reality, the effects of human activity can be identified anywhere on Earth, and understanding wilderness as separate leads us to see it as something to be dominated, claimed, or protected. Although this understanding of nature as a separate entity pervades Western culture, several research participants, as described above, echoed beliefs that rejected anthropocentric views. These ecologically-oriented perspectives are reminiscent of Aldo Leopold's 1987 essay "The Land Ethic." Leopold centers ecological interdependence in his work, emphasizing humans' total reliance on nature for survival. As such, "One cannot at once be a conqueror and member of a community, [so] we must change our relationship with nature" to reflect a role akin to citizenship (Robbins et al., 2014, p. 74).

Leopold's work shows that, from an ecological perspective, human concerns can be understood under the broader framework of ecological integrity, in which they participate in a natural community. In the future, therefore, perhaps we should move toward understanding environmental values as both universalistic and egoistic, as an ecological perspective allows for both the preservation of nature and the preservation of oneself. This confluence of values depends upon awareness of environmental and social

consequences alike that are caused by environmental problems. Climate change is a unique issue in that it unites the social and the natural worlds and brings into question the very distinction between them. The linguistic binary employed to differentiate between the “social” and the “natural” would suggest that humans exist in a separate realm, while in reality we remain wholly dependent on natural resources and ecological integrity. As a consequence of this understanding, to possess biospheric values is also to promote self-preservation to a certain extent. Similarly, the distinction between the social and natural worlds parallels that between altruistic and biospheric value orientations, once again pointing to the human constructs that delineate between various areas of concern and overlook the myriad connections between them. Future research, consequently, would do best to lessen the distinction between these value orientations to allow for a more holistic approach (discussed in further depth below).

In practical terms, therefore, values distinguishing between social or natural priorities may not matter as much as awareness of consequences and other beliefs about self-efficacy and the importance of various behaviors. It is more realistic to promote widespread environmental education, which proved to serve as a critical determinant of pro-environmental behavior for all participants, regardless of value orientation. As participants demonstrate, the ability to employ systems thinking, often as a result of environmental education, aids individuals in understanding the interrelatedness of various issues. The roles of both systems thinking and environmental education are discussed in further depth below.

The inseparability of various values and concerns, as described above, was expressed by research participants. One individual with a longstanding investment in social issues shared:

I'm very passionate about a lot of things. Anyone who talks to me would know; I really can't go a day without it being on the brain... In order to support all of the things that I care about-- I'm a Medicare for all proponent and I am very much a feminist and I care really deeply about corporate money in politics--when it comes down to it, nothing matters if the Earth is on fire. Nothing. Any action we take towards women's liberation, or feminist measures, or global inequities doesn't matter if we live to 2050, which is scary but also keeps me engaged.

This individual's awareness of human dependence on nature gave way to a broader ecological understanding, which in turn shaped their understanding of the inseparability of various value orientations. Put simply, to care about other humans or oneself demands that we address the environmental crises at hand.

Finally, the confluence of values demonstrated by participants offers another opportunity to improve upon the VBN framework. Given the difficulty of ascertaining the specific values behind pro-environmental behavior, the interrelatedness of values in an environmental context does not align with the rigid structure of the VBN Theory. Rather, biospheric, altruistic, and egoistic values can simultaneously underlie pro-environmental behavior due to the multifaceted consequences of environmental issues.

Systems Thinking

Systems thinking, which is characterized by consideration for the root causes of and connections between various actors, as well as for the long-term consequences and a wider perspective, is highly applicable to environmental sustainability (Seibert, 2018). Under a systems thinking approach about nature, humans understand themselves as part of a complex ecological network. This approach recognizes humans' total dependence on and connectedness to nature, as well as their ability to cause environmental consequences. To embrace systems thinking in this context would help lessen the need to distinguish between various value orientations, as this view recognizes that social and natural systems are inextricably linked. As a result, a systems thinking approach would help to resolve the confluence of values that emerged in the above section.

Our current system under the dominant worldview poses many barriers to a systems thinking approach. Participants voiced their feelings of disconnection from their individual environmental footprints because of the myriad barriers in an industrial and consumerist society. For several of them, this was due to the obscurity in the production of goods that is typical of most developed societies. One participant, when asked to describe the lifespan of a product that they purchase, use, and dispose of, stated:

I'm at fault for this too, and I should think more about it, but sometimes I just think the product starts and ends with me buying it off the shelf, and then when I recycle or throw it away that's it. I don't really think about how it's going to break down or compost... and I don't think about how it's made, and so I think I'm

usually very much at fault with that because I'm just so used to the comforts of living and how everything is basically at my disposal.

Although this individual, who specializes in the natural sciences, also provided a detailed description of the origin of other products when prompted, they expressed awareness of the lack of systems thinking prevalent within typical consumerism. Moreover, they were aware of their own tendency not to utilize a systems approach. For those who do not engage in systems thinking, the lifespan of a product starts on a store's shelves and ends when the consumer has exhausted its use. This paradigm does not consider, however, the environmental consequences that occur before and after a product is in consumer hands. Although many individuals with a basic concern for environmental protection consider recycling materials in order to prevent waste at the end of a product's lifespan, such an understanding does not account for the many resources that go into any given product's production, transportation, and storage.

Systems thinking encourages participants to consider all of these environmental and social factors (as well as the connections between them) when making environmentally relevant decisions. In this study, lifecycle-style thinking enabled participants to transcend the lack of tangibility and transparency that is characteristic of the system at hand. Among research participants, a robust awareness of consequences for specific environmentally relevant behaviors was often tied to environmental education, which enabled a systems thinking approach by making individuals aware of their impact even when such an impact was less tangible. When asked about their understanding of

the lifecycle of consumer goods, many individuals shared a complex conception of the production, distribution, consumption, and disposal of products. One participant exemplified systems thinking but identified its use as a recent shift in their life:

Prior to maybe a year ago I would have really [thought that clothing] gets sewn together and then shipped to the store and then I buy it and then I give it to Goodwill... Oh, that is just not the case. I've realized that that fabric and that thread and that material is not just coming from the seamstress right there; it's coming from the Earth at some place... So if I'm going to [buy] a sweatshirt you have to take that material. If it's cotton then you're taking that from a field or the plant... Then you have to transport it so that's one set of CO2 emissions, then you go to a manufacturer [that's probably not in the U.S.]. Then they're going to make it in China... then maybe they don't do the entire thing they just make the stitch or maybe the design and ship it someplace else. Then they make it there and then it's shipped to the warehouse which then ships it to the retailer and then either I buy it online, which is another shipment, or I buy it from the store. Then I wear it for probably less [time] than I should have worn it, and then I either give it to Goodwill or sell it to someone else and then I forget about it, but [it's] never going away.

This participant clearly has a robust understanding of the many processes involved in the production of clothing. Finally, this individual expressed the permanence of any given item following its usefulness in human terms. While our society reinforces

the separation of social and natural systems (an “out of sight, out of mind” mentality), a systems thinking approach expands our ability to understand the confluence of these systems.

Another participant, who has a background in 4-H and Future Farmers of America from a young age, identified food as their most significant point of connection to the natural world, despite the dichotomy between social and natural systems. They described how participation in agricultural education, as well as more formal education as a university student in Environmental Studies courses, fostered a strong sense of connection to food systems. In particular, this individual expressed a strong ecological understanding of environmental issues and humans’ participation in the former. In their words, “Since we’re such a dominating species, everything we do impacts the places where we are in ecosystems.” The ability to recognize the complex consequences of human behavior, demonstrated through the statement of this participant, is also characteristic of systems thinking and leads to a more accurate understanding of ecological impact.

Thinking about climate change forces us into long-term thinking (one of the characteristics of a systems thinking approach), as many of the existential threats scientists warn of are not yet visible in our day-to-day lives. Participants showed a mental flexibility in considering the “true cost” of their actions and the desire to prevent long-term harm to the environment and to themselves. In the words of one individual, “The upfront costs might be more but down the road... the true costs of things should make

more sense than having waste products and all the unforeseen consequences to fix.” Such long-term consideration is characteristic of a systems thinking approach, again showing the relevance of this approach to the climate crisis. The ability to engage in systems thinking also lessens the need to distinguish between various value orientations, as the consequences of climate change encompass a broad range of concerns. As such, a perspective with human dependence on nature in mind (utilizing systems thinking) lends itself more easily to climate change than those value orientations that draw strict distinctions between systems. A more holistic approach is discussed in greater depth in the Discussion.

The Importance of Environmental Education

In the context of pro-environmental action, behavior has a direct influence on environmental impact, whereas, as demonstrated in this research, the values that underlie this behavior can vary. As a result, the establishment of norms, or the personal standards for specific behaviors (Pereira & Forster, 2015), is the step of the VBN translation that is most relevant to mitigating climate change and promoting collective pro-environmental behavior. This research demonstrates the significance of awareness of consequences in the formation of beliefs about environmental issues and, as a result, the behaviors that individuals take in alignment with these beliefs. Although values remain an important part of this process, often creating a sense of moral responsibility to carry out these actions, multiple value orientations can yield pro-environmental behavior. Moreover, research participants demonstrate (as described above) that an altruistic value orientation

can come to include environmental values as a result of education about the ecological consequences of human behavior. Although value orientations themselves may not change easily, being the most enduring of these traits (Whitley, et al., 2016), education has the potential to add new dimensions or nuances to existing value systems.

In addition, many pro-environmental actions are not tangible and thus require education to be fully understood by individuals. Although recycling was described by many research participants as among the most satisfying of pro-environmental actions, this is far from the most significant way to minimize environmental impact, especially when considering the role of greenhouse gas emissions (see Project Drawdown's website, referenced above). However, and as several participants expressed, the nature of our industrialized society obscures the true consequences of many of our actions, such as the environmental impact of buying and disposing of items and food. When asked about their sense of dependence on nature, one participant responded, "I know that I am dependent on the natural environment, but because of capitalism and the way that the world is portrayed around us, it's really easy to dissociate from it." This sense of disconnection was echoed among other research participants (see Systems Thinking and the barriers to such an approach). Environmental education offers a solution to this disconnect by helping individuals to draw the connections between various complex elements (especially their own behavior) within a system.

Likewise, greenhouse gas emissions that result from products that individuals purchase are not easily quantifiable or observable by the consumer. As a result, such

aspects of individual and collective environmental impact require education and systems thinking to fully understand, and individuals are unlikely to adopt non-superficial pro-environmental practices without understanding the importance of these actions. In accord with this, most participants described making meaningful behavioral changes (i.e. beyond basic measures like recycling) after learning about the true environmental impact of their actions. For instance, one participant took an environmental course in high school and described, “It wasn’t until I learned about climate change in that class that I became more self-aware.” Other participants had similar experiences and underwent turning points when learning about the impact of actions including participating in fast-fashion, eating meat, and traveling by plane. Once participants were exposed to novel information about environmental issues that aligned with their values, they often sought out more meaningful information on their own, leading to a snowball effect on environmental education. This effect is described in greater depth in the “Role of Formative Experiences” section above.

One important obstacle to the power of environmental education is the feeling of limited self-efficacy. Many participants described feeling overwhelmed by the scale of global climate change and expressed a sense of hopelessness or disenfranchisement with the lack of large-scale collective action and policy. While many were able to recognize their own environmental actions as an important component of the broader environmental movement, none saw these actions as a replacement for systemic and political change. One participant described their feelings regarding this political inaction: “I [feel] like I have to do everything because they’re doing nothing... It [feels] like they are just taking

our future away.” Another individual, who has an academic background in political science, explained their desire to be part of structural change in the environmental sector. Despite a sense of inefficacy and disenfranchisement related to personal consumer actions, this participant was engaged in what they described as “bigger picture” change. More research is needed to better understand how a lack of self-efficacy is related to the impact of meaningful environmental education.

The impact of environmental education further suggests the need for refinement of the VBN theoretical framework. While the VBN theory posits a more stagnant approach to values, beliefs, and norms, this research demonstrates that growing awareness of consequences through meaningful environmental education has the potential to greatly influence beliefs and, consequently, behavioral norms.

Discussion

Towards a More Holistic Approach

This research demonstrates the difficulty of ascribing specific values to various pro-environmental behaviors. Additionally, a systems thinking approach demonstrates that the intersections between social and natural systems, as well as individuals’ self-preservationist tendencies in the climate crisis, blur the lines between value orientations. In accord with these intersections, Aldo Leopold’s “The Land Ethic” supports a recognition of humans as members, rather than dominators, of a broader ecological community (Robbins et al., 2014, p. 74). As a result, a more holistic approach has the potential to account for egoistic, biospheric, and altruistic values alike while refraining

from drawing sharp distinctions between them. Although these critical intersections between systems are infrequently recognized due to the anthropocentric binary between humans and nature (Robbins et al., 2014), the experiences of research participants reveal that meaningful environmental education can help individuals recognize the interconnectedness of various systems.

Such an understanding of value orientations echoes the characteristics of the New Environmental Paradigm, which advocates for a shift in the dominant worldview that centers human interests (Dunlap & Van Liere, 1978; Nair & Little, 2016). This necessitates a recognition of human dependence on nature, which in turn serves to unite the ultimate interests of various systems. Under the New Environmental Paradigm, concern for human outcomes recognizes the need for ecological integrity, thus merging concerns from various value orientations.

The data provided by study participants also indicate that a more comprehensive and intersectional value orientation is possible when the connections between systems are recognized. Such an approach could take the form of a holistic value orientation in which human wellbeing is aligned with environmental integrity, much like Leopold's ecological perspective and that of the New Environmental Paradigm. This shift would disrupt the binary between social and natural systems by recognizing that humans' ability to survive is inseparable from that of ecological systems, as well as understanding that environmental consequences are inherently related to social justice. Therefore, concern for social well-being necessitates that for environmental integrity and vice versa.

Moreover, understanding these systems as separate by naming them as such and differentiating between various value orientations inhibits the recognition of intersections and interdependence. Given the linguistic limitations created by this worldview, this research utilizes the VBN framework while recognizing the inherent limitations of distinguishing between value orientations. At the same time, the framework can be expanded upon by allowing for a more holistic approach to human values. Such an approach could be based upon a worldview that emphasizes interconnectedness and interdependence, thus understanding the confluence of values as natural rather than deviant. Systems thinking indicates an existing tool for fostering such a perspective, as this approach emphasizes the relationships between various actors and the multifaceted impacts of any given action.

In recognition of these intersections between systems, other authors suggest that such a paradigm shift is necessitated by the current harmful patterns that are ingrained in the consumerist societies of the developed world. In the words of Faviana Rodriguez (2020),

Our current relationship to the Earth is based on a worldview of domination that supports an extractive economy. This is a myth of man's making, and it's one that has influenced our cultural imaginations since Westerners conquered the land, ravaged Indigenous communities, and built a society around fossil fuel extraction, industrial animal agriculture, cheap labor, and what Greta Thunberg calls 'fairy tales of eternal economic growth' (121).

Rodriguez earnestly identifies the myriad ways in which the present system is leading us toward the destruction of ourselves and the planet that provides for us. Moreover, the degradation of natural systems is inseparably related to systems of oppression. She also makes clear that these unsustainable practices stem from a worldview that treats humans, other species, and the planet as disposable. The consequences of such a worldview are recognized in the grim tone of scientific assessments like those of the IPCC. To make the dramatic shifts demanded in these reports will require changes in the mental models that underlie human activity, which suggests the relevance of values and their translation into action in such widespread shifts towards a sustainable system.

A more holistic worldview and value orientation stands to recognize the failures of the current system and to incorporate the wellbeing of humans and the myriad natural systems that make our existence possible. The findings of this study suggest that a value orientation of this kind is entirely possible, having drawn the connections between environmental degradation, social oppression, and the extractive economic systems of Western societies. As such, a holistic perspective unites concern for these various issues and shapes a worldview that is based upon these connections.

An understanding of these connections is also likely to lead to more robust environmental action. Those with a more superficial understanding of environmental issues tend to see these issues as separate from other systems. The findings of this study demonstrate that tangible yet basic actions like recycling are often understood as

environmental solutions. However, a robust awareness of environmental consequences by means of environmental education has the power to change the way that individuals contextualize these issues and understand the multifaceted impacts of both tangible and intangible human actions. When individuals apply systems thinking, it becomes clear that environmental and social issues both emerge within the context of an extractive and oppressive economic system that reduces the viability of humans and nature alike.

The Role of Biophilia

Despite exhibiting the potential for a holistic value orientation that integrates social and natural concerns, the findings of this study indicate the prevalence of feelings of distance from nature. In large part, this disconnect is due to life in an urban environment and industrialized system. While participants in this study were highly aware of social issues and their ties to the former, they frequently expressed feelings of disconnect from nature. One factor that emerged as a remedy for environmental isolation was regular exposure to nature or natural elements, which frequently appears to have spiritual or grounding effects for individuals (as described above in “The Confluence of Values”). These findings raise the importance of biophilia, which refers to humans’ innate affinity for nature (Rogers, 2019). This affinity is often understood as having a genetic basis, given that in evolutionary terms, the transition into urban environments is a very recent shift in human history (Rogers, 2019). Biophilia is therefore considered a relevant strategy for environmental conservation, as promoting the human connection to

nature stands to increase appreciation for biodiversity and, consequently, the desire to protect natural systems.

Connectedness to nature emerged as an important theme as well, and biophilic experiences were often described as being soothing or stabilizing to the participants in this study. Environmental consciousness seems to be a vein of awareness that runs through the daily lives of individuals who express a more holistic value orientation, informing their decisions and shaping their worldviews. This more fully integrated version of environmental concern guides the way in which individuals interact with social and natural systems alike. The impact of biophilia also demonstrates the power that nature wields over humans, who, despite their ability to exist in relative disconnect from the former, frequently respond in a profound way to natural environments, which can, in turn, promote pro-environmental behavior. In accord with this, past research has demonstrated the formative potential of place-based education in an environmental context, which connects learning to specific locations and contexts (Baird, Hutson, & Plummer, 2020). As Baird et al. (2020) demonstrate, place-based education can be utilized to foster connectedness to nature and awareness of relevant issues, therefore serving as a practical tool for promoting environmentally responsible behavior. As a result, offering opportunities for individuals to establish connections to nature through profound ties to specific places should be an area for consideration when implementing environmental education programs.

A holistic value orientation, which recognizes the ecological dependence of humans, can help account for the semi-spiritual role of nature in our lives and the innate tendency to be drawn to natural spaces. Biophilia, in turn, can serve as an important tool for fostering such a value orientation. As the findings of this study suggest, an urban and industrialized lifestyle is not conducive to biophilic connections; rather, these points of connection are often sought out by those who recognize their value. As a result, access to natural spaces, especially in the context of place-based environmental education, is likely to provide a fruitful opportunity for fostering pro-environmental action in the future.

A Note on Indigenous Knowledge

Indigenous knowledge systems are an existing body of knowledge that integrates many of the key findings discussed in the Analysis of this study. This research demonstrates the role that systems thinking plays in fostering a robust understanding of environmental consequences and therefore suggesting the need for a holistic worldview. Echoing the need for a broader viewpoint, Indigenous activist Winona LaDuke's essay "Traditional Ecological Knowledge and Environmental Futures" (1994) describes the incompatibility of the current system with a holistic perspective. In her words, "The conflict between two paradigms--industrial thinking and indigenous thinking--becomes central to the North American and, indeed to the worldwide, environmental and economic crisis" (p. 133). As such, an Indigenous perspective encompasses and reconciles the various issues that emerge under the dominant system, pointing to a way of life that facilitates social and ecological harmony. Unfortunately, Indigenous knowledge has long

been ignored within Western cultures. As environmental action continues to expand on local and national levels, this body of thinking can be utilized as a resource while simultaneously providing seats at the table for long-marginalized Indigenous communities.

The potential for a holistic value orientation, as discussed above, also reflects the intersecting values and concerns expressed by participants. These concerns include personal wellbeing, environmental integrity, and social equity, among others. A more holistic approach therefore has the ability to integrate these various concerns into a cohesive worldview based on ecological and social wellbeing. This perspective mirrors many of the characteristics of Indigenous knowledge, further highlighting the value that already-existing systems can offer. This is especially relevant when considering the way in which Indigenous communities have intimate ties to specific natural places. As lawyer and Indigenous rights activist Sherri Mitchell (Weh'na Ha'mu Kwasset) describes in her essay "Indigenous Prophecy and Mother Earth":

Seeing the world through an Indigenous lens requires one to take a world-centered view that recognizes the relationships that exist among all living systems and the many ways that these systems are constantly moving toward harmony and balance. Unfortunately, a great deal of critical Indigenous knowledge has remained outside the carefully ordered categorization of Western thought, making its holistic concepts difficult to comprehend for those who have been trained to see the world in fractured pieces (2018, p. 18).

Mitchell makes clear that the current dominant worldview, which is based upon an extractive economy and remains detached from natural processes, cannot support a holistic awareness of both social and natural systems. The very fact that we distinguish between humans and nature reflects this mental rigidity and prevents meaningful ecological analyses of environmental issues. Mitchell continues, “The anthropocentric beliefs and philosophies that have ruled mainstream ideologies for generations are incapable of accommodating the holistic view needed to escape our current predicament” (2018, p. 21). Here, Mitchell raises the need for a more general overhaul of human-centered value orientations in order to confront the climate crisis. This statement echoes the findings of this study, which suggest the limitations of the current classification of various value orientations that tend to center humans. Consequently, employing systems thinking yields an understanding of the interconnectedness of humans and nature (as described in the Systems Thinking section of the analysis), therefore recognizing that concern for social wellbeing inherently demands environmental solutions, too.

Indigenous knowledge represents a wealth of information about how to recognize these connections and seek a sustainable and ecologically harmonious way of life for humans. Although this knowledge is often discredited or ignored within Western societies, the social and natural crises we face provide an opportunity to integrate longstanding, sustainable ways of knowing that validate marginalized groups while pursuing innovative solutions. Various prominent environmental groups, including the United Nations, have recognized this potential: Making up just 5% of the world’s population, Indigenous land is home to around 80% of global biodiversity (Mitchell, 2018, p. 18). It is clear,

therefore, that protecting Indigenous rights (including respecting and utilizing Indigenous knowledge) is critical to preserving ecological integrity and seeking solutions to global climate change.

Finally, Indigenous knowledge offers a solution for the lack of awareness of human-nature interdependence that is common among Western cultures. Embracing the need for recognition of these connections, “Indigenous kinship systems provide models of reciprocal care. We care for Mother Earth and Mother Earth cares for us” (Mitchell, 2018, p. 24). The participants who actualized such an understanding took more meaningful environmental action, thus suggesting the integral role that Indigenous knowledge can play in human values and, consequently, in addressing the climate crisis.

Conclusion

As humans approach the ecological limits of the planet (IPCC, 2018), meaningful behavioral changes will play a key role in climate change mitigation and adaptation. The changes that scientists say we need to enact to avoid the worst consequences of global climate change will require a widespread transformation to escape from our dependence on fossil fuels. This mobilization will require massive shifts in established social structures, demanding a willingness to rethink existing conditions and to grasp the necessity of such drastic measures. As a result, the values and beliefs that underpin human behavior are a critical point of study for climate adaptation.

The qualitative data collected in this study offer insight into the development of pro-environmental behavior by means of the translation proposed by the VBN

framework. In addition, this research has demonstrated the relevance and limitations of the VBN Theory as applied to environmental issues. Although the VBN Theory serves as a useful theoretical framework for understanding the translation of values into beliefs and, subsequently, behaviors, this research demonstrates that other factors, especially environmental education, should be incorporated into this framework (see Figure 1). Value orientations remain an important determinant of beliefs and behaviors, yet this research also echoes the difficulty of ascribing pro-environmental behavior to a single value orientation, which has been described in past research (Ghazvini et al., 2016). In accord with this finding, the described experiences of study participants indicate that various value orientations can motivate pro-environmental behavior. Given that environmental issues can be interpreted in terms of biospheric, social, or personal impact, a more holistic value orientation can better address this field. As a result, environmental education about humans' absolute dependence on natural systems can help individuals draw meaningful connections between these interconnected elements. Environmental education and systems thinking therefore have the potential to shape *how* values are translated into actions, as a lack of awareness about consequences is unlikely to lead to outcomes that are fully aligned with one's values. This is especially true in a system in which the consequences of many actions are obscured. Reflective of the findings of this study, approaches that utilize systems thinking seem to offer significant grounds for drawing such connections and, consequently, approaching a more holistic value orientation.

In consideration of the findings described above, especially the need for a more holistic understanding of human values within an ecological context, Indigenous knowledge offers a promising resource for confronting the climate crisis. This kind of knowledge is based upon relationships of human-environmental harmony, therefore providing a sustainable alternative to the extractive worldview that characterizes Western societies (LaDuke, 1994). Indigenous knowledge also utilizes the characteristics of systems thinking, taking into consideration the intricate relationships between natural elements and concern for long-term impacts and future generations (LaDuke, 1994; Mitchell, 2018). Such consideration echoes many of the pro-environmental thought processes and behaviors exhibited by participants in this study, while at the same time integrating these elements into a single environmentally grounded worldview. Indigenous knowledge also closely parallels the elements of ecological interdependence that are characteristic of the New Environmental Paradigm and a more holistic value orientation. As such, existing bodies of Indigenous knowledge are highly applicable to the climate crisis, and utilizing this knowledge can confront environmental issues while simultaneously allowing for long-marginalized groups to have a seat at the table. Although this type of knowledge is not discussed in great depth in this study, it offers a fruitful basis for future research and action with regard to environmental values, beliefs, and behaviors.

Limitations

This research exclusively studies college students with a demonstrated interest in environmental issues. Although some of these individuals developed environmental interest as late as college, many were exposed to environmental values and education at a young age. Biophilia and the exposure to outdoor spaces were also correlated with the formation of a biospheric value orientation. It is important to note that such exposure to nature is related to socioeconomic privilege; a 2019 study found that access to green spaces was related to race, income, and education level (Florida, 2019). As a result, if exposure to nature is an important determinant of pro-environmental values, beliefs, and behavior, systemic inequities are likely to inhibit these patterns in underserved populations. However, systemic environmental and social inequities cannot be oversimplified to suggest that exposure to natural spaces can solve these conditions while promoting environmental responsibility. To do so would neglect the widely varied and systemic aspects of environmental injustices. Likewise, students at a predominantly white, private institution are not representative of the broader population, making extrapolation difficult. Rather, further research regarding environmental and social equity is necessary to explore this broad and complex issue. As such, and although this research demonstrates the importance of environmental education in the development of pro-environmental behaviors and suggests benefits to the emotional wellbeing of individuals who feel a sense of connection to nature, the conclusions of this study are limited in scope. Further research is needed to explore environmental values in other populations and better understand systemic environmental inequities.

In addition, the sample studied in this research was limited to a small number of students (n=10) with a demonstrated sense of environmental responsibility. The research findings cannot, therefore, be extrapolated to the general population. Rather, as an in-depth, qualitative study with a small sample size, this study offers the grounds for future research surrounding environmental education and values based on the characteristics of individuals with existing environmental values. More research is needed to better understand environmental values, beliefs, and behaviors among other more general populations.

Directions for Future Research and Implications for Action

Future research is needed to further investigate the relationship between environmentally relevant values, beliefs, and norms, as well as the other contextual factors that influence the translation process described in the VBN Theory. These factors include connectedness to nature, self-efficacy, and environmental education. The role of systems thinking in environmental understanding should also be further investigated as a tool for promoting ecologically sound behavior.

The interviews with research participants clearly raise the importance of environmental education in fostering environmentally responsible behavior. Especially when considering the common feeling of environmental-social disconnect experienced by research participants, education (particularly that that utilizes systems thinking) is a critical tool in helping individuals understand their connections to and dependence on nature. One participant specifically noted that food was their primary point of connection

to the natural world. This implies that specific tangible experiences in both formal and informal contexts can be useful in helping individuals build more meaningful understandings of ecological interdependence.

Biophilia is also a tool for developing holistic connections to nature and promoting environmental action, an outcome which is suggested by this study and past research (Rogers, 2019). Those participants who had more immersive or memorable experiences in nature as young children professed a deep affinity for the outdoors and, consequently, a desire to protect these areas. It is important to note that we cannot determine causal relationships based on this research. However, the qualitative accounts of the environmentally minded individuals in this study demonstrate that exposure to nature from a young age is positively associated with biospheric values and pro-environmental action. Further research is needed to better understand this relationship.

Finally, the potential for a more holistic value orientation should be further explored. This research shows that a realization of the connections between social and natural systems leads to the confluence of various value orientations. However, existing research tends to uphold the distinctions between ecologically and socially oriented value orientations. The New Environmental Paradigm and Indigenous knowledge both offer a solution to these divisions by raising the need for a broad shift in the dominant worldview in recognition of the interconnectedness of humans and nature. However, such a shift has yet to be recognized in prominent literature surrounding the VBN Theory.

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Appendix A: Interview Schedule

In brief terms, how would you describe your relationship with the natural world?

Do you envision yourself as being part of the natural world? If yes, in what way?

Were there formative experiences in your life that promoted a sense of environmental responsibility?

Do you see yourself as dependent on the natural environment?

How do you see your role as an environmental actor? Do you think of yourself as part of a natural ecosystem? In your mind, how does the role of humans relate to that of other species?

Can you walk me through your understanding of the lifespan of a product you purchase, use, and dispose of? How do you think about each of these steps? Where does the lifespan of a product start and end in your mind?

Are you familiar with the circular economy? (If no, provide a brief explanation, then follow up): Does the circular economy provide you with a sense of connection to nature? If yes, how so?

When you purchase something new, which factors go into this decision? Which are most important?

Which environmentally minded actions make you feel most accomplished? Can you draw the link between these actions and your feelings about your connection to the environment?

Are you more inclined to take environmental actions for which you can see the impact (i.e. using bamboo toothbrushes as opposed to purchasing a carbon offset)? What role does tangibility play, if any?

Why are you an environmentalist?